1990

The Development of a New Measure of Personality Hardiness: Exploration of Its Factor Structure and Initial Assessment of Its Psychometric Characteristics

Thomas F. Horan
Loyola University Chicago

The Development of a New Measure of Personality Hardiness: Exploration of its Factor Structure and Initial Assessment of its Psychometric Characteristics

by

Thomas F. Horan

A Dissertation Submitted to the Faculty of the Graduate School of Loyola University of Chicago in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

May

1990

ACKNOWLEDGEMENTS

The author would like to express his gratitude to his committee for their individual and collective help. Dr. Steven D. Brown, chairman of the committee, was an invaluable source of knowledge and technical assistance. He also has been a source of helpful professional advice, and of a catching, irrepressible interest and enthusiasm for research. Dr. Gloria Lewis and Dr. Kevin Hartigan offered helpful ideas, support, and enthusiasm not only for this research but throughout the author's doctoral studies. The author is, indeed, grateful.

The author also expresses gratitude to Dr. John Wellington, who served as faculty advisor until his retirement in 1988. Dr. Wellington was always a source of helpful advice and warm, personal encouragement.

Finally, the author expresses his appreciation and gratitude to his parents and family for their constant love, support, and encouragement.

VITA

The author, Thomas F. Horan, is the son of Michael J. Horan and Frances (Hill) Horan. He was born January 19, 1942, in Oak Park, Illinois.

His early education was acquired at Ascension elementary school and Oak Park-River Forest High School in Oak Park.

From 1960 to 1966, Mr. Horan attended Xavier University in Cincinnati, Ohio, and Loyola University, Chicago. He received the Bachelor of Arts, major in Philosophy, at Loyola, June, 1966.

He obtained the Master of Arts degree in English literature (1971) and the Master of Divinity (1973) through Loyola University. He also pursued intermediate and advanced studies and training in Clinical Pastoral Education near Boston, at the Psychosynthesis Institute in San Francisco, and at the Center for Psychoanalytic Studies in Chicago.

The author has taught in high school and university settings and coached track and field. He has provided short and long-term individual, family, and group counseling/therapy in a wide variety of inpatient and outpatient settings, including state and private institutions and schools.

He was a staff member for two years at the Institute for Spiritual/Personal Leadership and Counseling in Chicago.

He worked at the Lincoln Park Clinic at Columbus

Hospital, associated with the Center for Psychoanalytic Studies, for two years as part of his externship and then internship training.

TABLE OF CONTENTS

LIST OF TABLES

CONTENTS OF APPENDICES

CHAPTER I

Rationale for the Current Study

The purpose of the current study is to explore the factor structure and begin to assess the psychometric characteristics of a new measure of the "hardy personality."

This chapter first provides a brief introduction to various strategies used in the study of stress/illness relationships. Second, it focuses on one approach: the research by Kobasa and her colleagues on the hardy personality. The discussion of the hardy personality will include a summary of the background, definitions, hypotheses, and findings. Third, the discussion will explore the conceptualization and measurement problems involved in Kobasa's research. Fourth, it outlines the intent, goals, and general method of the current study.

Studies of the Stress/Illness Relationship

The general context for research on the hardy personality lies in the literature on stress-illness relationships, a part of the larger domain of health psychology. Early studies on the relationship between stress and illness adopted a straight correlational research design (Holmes & Rahe, 1967; Dohrenwend & Dohrenwend, 1974; Holmes & Masuda, 1974). These studies typically found a significant but modest correlation of about

.30 between stress and various psychological and physical symptoms, meaning that stress scores were accounting for about 9% of the variance in individuals' illness scores (Rabkin & Struening, 1976). Given these modest correlations, more recent studies have adopted one or another research strategy intended to account for more of the variance and simultaneously provide greater understanding of various proposed stress-resistance resources. Several such strategies have been proposed, including reoperationalization and/or reconceptualization of the stress variable, identification of subgroups of the population for whom the stress-illness relationship is particularly strong or weak, and investigation of the role of moderator and/or mediator variables as discriminators between subgroups.

The Hardy Personality Construct

One recent research program that has been influenced at least in part by all of the strategies mentioned above and that has received considerable attention in the literature is the work of Kobasa and her colleagues on the "hardy personality" (Kobasa, 1979a; 1982b; Kobasa, Maddi, & Courington, 1981).

Following the strategies suggested by the newer approaches to studying the stress/illness relationship, Kobasa regarded "stress" as not simply an external event that occurs independently of a person's perceptions and actions. Rather, she hypothesized that a study of individual differences

existing both in perceptions of and responses to stressful events would lead to increased predictability of illness following exposure to stress. Kobasa, therefore, hypothesized that there must be subgroups in the population for whom the stress-illness relationship is particularly strong or weak.

She sought to find a basis for discriminating such subgroups in what she regarded as an under-studied area of investigation: personality in its relation to stress/illness. Kobasa felt that previous stress research manifested two interrelated faults: 1) little emphasis on personality theory, and 2) over-emphasis on single variable-based research rather than person-based research (Kobasa, 1985). Consequently, Kobasa incorporated existential personality theory into her research because she found this particular theory especially relevant to a study of the association between personality and response to stress (Kobasa, 1979a, 1982b, 1985). In particular, Kobasa was attracted to two tenets of existential theory which she felt offered an optimistic view of persons' capacities. First, rather than passively reacting to external events, people actively construe and respond to their environment. Second, life is inevitably characterized by change, and people can learn not only to adapt but also to develop in the face of "stressful" change. Following the perceived need to study more than single variables, Kobasa selected from existential theory three personality concepts

that she determined should be studied, not singly, but together: commitment, control, and challenge. She hypothesized that these three personality constructs would be especially relevant to discriminating subgroups of the population who would be particularly stress-resistant. These constructs, taken together, constitute the "hardy personality."

Kobasa and Puccetti (1983) reported corroborative support in earlier research for the three components of the hardy personality as a source of resistance. For the control component, they pointed to studies by Lefcourt (1973) and Rodin & Langer (1977) on control as a buffer against stress-induced illness. For the commitment component, they referred to Moss (1973) who reported that those most likely to become ill are the alienated. Kobasa and Puccetti saw alienation as negatively related to commitment. For the challenge component, they found a parallel in the research on the sensation-seeking motive (Smith, Johnson, & Sarason, 1978).

Kobasa (1982b) also regarded previous concepts such as competence (White, 1959); propriate striving (Allport, 1955); productive orientation (Fromm, 1947); and self-efficacy (Bandura, 1978) to be similar to the concept of the hardiness constellation.

Throughout her writings, Kobasa descriptively defines each component of hardiness (e.g., Kobasa 1979a, 1979b, 1982b; Kobasa, Hilker, & Maddi, 1979). The following descriptions

represent a summary of each component's definition.

Commitment is described as including the following: meaningful involvement in one's self, work, family, friendships, and community; a sense of purpose and direction; a belief in who one is and what one is doing; a prioritized set of values; an ability to find meaning in all experiences; a sense that one is being counted on by others; and a sense of basic trust in the world.

Control is described as including: the belief that one can direct and/or influence events; the belief that one's self is the primary influencer and/or director of events; the tendency to seek explanations for the cause of events in oneself; a sense that one can act and make decisions on one's own; a sense of personal responsibility in one's interactions; the possession of a flexible coping repetoire; and the capacity to effectively perceive, appraise, and incorporate events into an overall life plan.

Challenge is described as including: a view that change represents an opportunity for growth rather than a threat to security; a tendency to be cognitively flexible and open, and able to tolerate ambiguity; a desire to seek new experiences; a familiarity with where one could turn for supportive resources; a deliberate practicing to respond to the unexpected; and a realized capacity to be a catalyst in one's environment.

As implicitly inherent in the above descriptions, Kobasa

regarded the components of hardiness to incorporate both a cognitive and a behavioral level. On the cognitive level, hardiness reflects a general, optimistic belief system about self and world. On the more behavioral level, hardy people are hypothesized to engage in "transformational coping," as opposed to "regressive coping." Kobasa, Maddi, Donner, Merrick, and White (1984) describe regressive coping as the tendency to respond to stress with such reactions as denial, anger, drinking, and medication. Transformational coping is more vaguely described as finding active ways to transform stressful events into opportunities for personal and societal growth. Or, if such an active transformation is not possible, transforming the events by reinterpreting them in less threatening terms. Kobasa also compared transformational and regressive coping to Folkman & Lazarus' (1980) concepts of problem-focused versus emotion-focused coping.

Kobasa's first step, after selecting and descriptively defining the three concepts composing the hardiness constellation, was to formulate a three-pronged hypothesis which states that among persons under stress, those who have a greater sense of commitment, control, and challenge will remain healthier than those who have a lesser sense of commitment, control, and challenge (Kobasa, 1979a, pp. 3-4).

The second step was to reduce the number of instruments (6) and subscales (19) employed to index the hardiness

composite in the first study. This reduction was accomplished, in part, through a series of t-tests and a discriminant function equation employed to specify which subscales best discriminated between the high stress/high illness and high stress/low illness groups. Having performed these tests, Kobasa selected the six subscales from four instruments which seemed to best index hardiness as a composite. This number was subsequently reduced to five subscales from three instruments. These three instruments (i.e., the Alienation Test, the External vs. Internal Locus of Control scale, and the California Life Goals Evaluation Schedule) with their subscales measured the components of hardiness negatively; that is, they measured degree of alienation, external locus of control, and security orientation. (Kobasa, 1979a, 1979b.)

The third step, using the above measures, was to explore the stress-resistant effects of the hardiness components through a series of retrospective and prospective studies. The retrospective studies, while revealing some differential effects for the components of hardiness among three professional groups, revealed that hardiness apparently protects against illness under conditions of stress. The prospective studies revealed that the hardiness components appeared to: 1) protect against future illness, and 2) have their greatest effect under conditions of higher stress. (Kobasa, 1979a, 1979b, 1981, 1982a; Kobasa, Maddi, &

Courington, 1981; Kobasa, Maddi, & Kahn, 1982.)

The fourth step was to assess the effects of hardiness in relation with other stress resources on reported illness scores. A series of four studies revealed that the more resources one has, the more protected he/she is from illness. Relative to the other resistance resources (exercise, non-Type A personality, social assets, and perceived social support), hardiness was found to offer the most significant protection (Kobasa, Maddi, & Puccetti, 1982; Kobasa, Maddi, & Zola, 1983; Kobasa & Puccetti, 1983; Kobasa, Maddi, Puccetti, & Zola, 1985).

Measurement Issues in the Hardiness Research

While the studies by Kobasa and her colleagues offer promising findings on the role of the hardiness constellation, several methodological issues have arisen. The issues most commented on by other researchers and most relevant to this study concern how the hardiness components have been operationally defined (i.e., measured).

The first, and perhaps foremost, measurement issue involves the use of negative indices of each of the hardiness components: commitment indexed by a measure of alienation, control by a measure of external locus of control, and challenge by security orientation. Commenting on this issue, Funk and Houston (1987) stated:

The use of negative indicators to measure hardiness

> creates substantial conceptual and empirical problems. It entails an attempt to index high levels of one characteristic (e.g., commitment) through low scores on another (e.g., alienation). For example, the use of a scale that measures feelings of alienation to negatively index commitment implies that commitment is the converse of alienation. It may be argued that unity, not commitment, is the converse of alienation. Moreover, a low score on a scale of alienation may represent neutral feelings.... (p. 573)

Researchers have also proposed that measuring hardiness negatively occasions a considerable confounding with measures of general maladjustment (e.g., Cohen, 1988; Funk & Houston, 1987).

The second measurement issue has to do with the multiplicity of indices used. Kobasa started with nineteen subscales. These were subsequently reduced to six, and then to five. Additionally, Kobasa and her colleagues have been cited as sources for several measures of hardiness other than the measure that has been reported on in the literature (Rhodewalt & Agustsdottir, 1984; Schlosser & Sheeley, 1985; Hull, Van Treuren, & Virnelli, 1987).

A third, related, issue involves two areas of inconsistency. The first involves inconsistency from study to study in what measures are used to index each of the hardiness

components. For example, Kobasa used the Powerlessness subscale of the Alienation Test as an index of commitment in the study on lawyers (1982a), while in other studies, Powerlessness was conceived of as related to control and used as an index of the control component. The second inconsistency concerns whether predictions for hardiness to criterion variables are tested and reported as a composite (Kobasa, Maddi, & Kahn, 1982; Wiebe & McCallum, 1986), or for the three components separately (Kobasa, 1979a; Ganellen & Blaney, 1984). This latter inconsistency stems in large part from confusion over the dimensionality of the hardiness construct.

The fourth issue involves the paucity of published psychometric data on the hardiness indices. Only some summary results from a principal components analysis of the negative indicators of hardiness have been published. Additionally, little empirical data are reported that would explain Kobasa's selection of the five negative indicator subscales that she eventually selected from the nineteen subscales used in the initial study of hardiness. Only two of these five subscales were among those reported to have had both a significant *t*-value and to have contributed to the discriminant function equation used to predict subjects' membership in either the high stress/high illness or high stress/low illness group (Kobasa, 1979a, 1979b).

The final issue concerns the dimensionality of the

hardiness construct. The issue is whether or not the three components (commitment, control, and challenge) are all indicators of a single underlying dimension termed "hardiness." In most of her published studies, Kobasa has reported on a principal components analysis showing that the three components all load significantly on a single dimension. Therefore, she used a single, composite z-score to index a person's degree of hardiness. Hull, Van Treuren, & Virnelli (1987) however, state that in a personal communication with Kobasa and Maddi in 1982, factor analytic data were presented by Kobasa showing that the subscales of the hardiness measure were "refined to load on only one of three uncorrelated factors (commitment, control, and challenge)" (p. 520). The lack of sufficient clarity on this issue has led some subsequent researchers to treat hardiness as unitary (e.g., Kuo & Tsai, 1986), while others, claiming that important information is lost by use of a single score, treat it as multi-dimensional and assess the independent effects of the components (e.g., Ganellen & Blaney, 1984; Rich & Rich, 1985).

Three research teams have also carried out their own factor analyses of the items of the hardiness subscales (Funk & Houston, 1987; Hull, Van Treuren, & Virnelli, 1987; Rich, Sullivan, & Rich, 1986). Summarily, it may be noted that they reached different conclusions concerning the appropriate factor structure or dimensionality of the hardiness construct. This

lack of agreement, along with the other measurement issues, suggests, at a minimum, two interrelated and still unanswered questions: 1) How is "hardiness" to be conceptualized?, and 2) What is the dimensionality of the hardiness construct?

Intent and Research Questions of the Current Study

The current study's intent was to construct and factor analyze a new, single instrument intended to index not the degree of alienation, external locus of control, and security orientation, but, directly, the degree of commitment, control, and challenge orientation.

Since the two major questions concern conceptualization and dimensionality, the construction of the new measure has followed as closely as possible Kobasa's original theory-based conceptualization of hardiness. Further, in order to avoid as much as possible the confounding of hardiness with indices of pathological symptomatology, care was taken that items describing symptoms were not included in the new measure. This issue has also been addressed by the avoidance of the use of negative indices.

Likewise, the analytic strategy employed to analyze the data was selected because it seemed the most suitable to addressing the same two major questions. This analytic strategy involved a principal components analysis of the new measure, followed by tests of the invariance of the final component solution across two randomly divided subgroups of the

total sample and across three factor extraction methods. (Cattell, Balcar, Horn, & Nesselroade, 1969; Norman, 1965). This was followed by a higher-order principal factors analysis of the final component solution in order to further address the issue of dimensionality.

This study was designed to address the following questions:

1) Is there empirical support for the three components that Kobasa has theorized to compose the hardiness constellation? 2) Is there evidence for a single dimension underlying the data that corresponds to general personality hardiness as defined by Kobasa?

3) Can sufficient reliability and validity be attained by the use of a simple summated ratings procedure to estimate scale scores? (Likert, 1932.)

An adult (age 25 or over) population of students who attended the University College of Loyola University of Chicago during the 1987-88 academic year was used for this study. This choice of adults who were returning to college, rather than a typical 18-22 year old undergraduate population, was made for several reasons. First, it was felt that adult-age subjects would have had more life experience, and be involved in many different areas of life that made demands on their time, energy, and personal resources, thus likely being exposed to more stress and/or daily strain. Second, it was thought that

the adults would more likely represent a greater diversity of life circumstances and sources of stress. Third, following Kobasa's theoretical hypothesis that hardiness may be a developmental characteristic or set of characteristics, it was thought that an adult population would be more suitable. Finally, it seemed that the 18-22 year old undergraduate population has had more than its share of representation in psychological research.

CHAPTER II

REVIEW OF RELATED LITERATURE

Approaches to the Study of Stress and Illness

Kobasa (1979a,b) introduced the construct of the hardy personality in part as an attempt to address some of the limitations of earlier research on the stress-illness relationship.

Life Events Paradigm Approach: Correlational Studies

Early research on stress and illness was stirred by Adolf Meyer's (1948, 1951) emphasis on the importance of environmental influences on health and disease, by Walter Cannon's (1932) discussion of biological adaptation and the importance of the maintenance of homeostasis, and by Hans Selye's (1956) theory that stress induces a specific set of responses called the General Adaptation Syndrome. The basic paradigm in the work of these three researchers was that stress results from the disequilibrium occasioned by environmental changes (events) which then require the organism to readjust.

Following this basic paradigm, many early psychological and epidemiological studies on the relationship between stress and illness operationalized a person's stress level as amount of exposure to major life-change events. These early studies

investigated the degree of correlation between the occurrence of major life events and either physical illness (e.g., Casey, Thoreson, & Smith, 1970; Holmes, 1970; Rahe & Lind, 1971) or psychological disorder (Birley & Brown, 1970; Brown, Harris, & Petro, 1973; Coates, Moyer, & Wellman, 1969; Dohrenwend, 1973a).

Though all of these studies quite consistently documented significant linear correlations between frequency of major life-change events and physical and/or psychological illness, the correlations were modest, leaving a significant amount of variance unexplained. The correlations generally were in the range of .12 to .40 (Cooley & Keesey, 1981), with an average of .30 (Kobasa, 1981; Rabkin & Struening, 1976), and frequently, the standard deviations were larger than the means (Holahan & Moos, 1986).

In an attempt to enhance predictive power, while still following the same nomothetic paradigm of the major life events studies, some researchers reoperationalized the stress variable as 1) recent life crises, 2) chronic strains, or 3) daily hassles. Recent life crisis research documented relationships between such criterion variables as psychological distress, impaired social functioning, and impaired physical health and such crises as death of a spouse or child (Lindemann, 1944; Parkes, 1975; Parkes & Weiss, 1983; Vachon, et. al., 1982); divorce (Crago, 1972; Gove, 1972; Wallerstein & Kelly, 1980);

rape (Burgess & Holmstrom, 1974, 1979); and joblessness (Brenner, 1973; Gore, 1978; Kaufman, 1982).

Other researchers found a closer link between stress and nonspecific forms of emotional distress (e.g., depressed mood) when they used chronic role strain rather than major life events as an index of stress (e.g., Croog & Fitzgerald, 1978; Eckenrode, 1984; Mitchell, Cronkite, & Moos, 1983; Pearlin, Lieberman, Menaghan, & Mullan, 1981).

A third group of researchers reoperationalized stress as "daily hassles." For example, R. S. Lazarus and his colleagues (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982); Kanner, Coyne, Schaefer, & Lazarus, 1981) found that major life-change events were less predictive of poor health outcomes than were relatively minor but frequent stressors. Many subsequent studies have corroborated these findings (e.g., Monroe, 1983; Weinberger, Hiner, & Tierney, 1987; Zika & Chamberlain, 1987). However, though hassles appeared to be a better predictor than major events, large individual differences were still apparent. De Longis, Folkman, and Lazarus (1988), for example, found significant correlations between daily stress measures and reported physical symptoms, but no clear correlation with psychological symptoms. In addition, they found large individual differences for both physical and psychological symptoms; e.g., some one-third of respondents reported

moderately improved health and mood on days when hassles increased.

Findings of such modest correlations and large individual differences as those reported in the above study, highlighted the limitations of the life-change events /health outcome nomothetic paradigm (Silver & Wortmann, 1980; Thoits, 1983). Consequently, many researchers hypothesized that degree of life-change per se does not produce distress. Reviewing factor analytic studies of the dimensionality of life events, Thoits (1983) concluded that "...change in combination with other event qualities (e.g., undesirability, uncontrollability, time clustering) appears to produce distress" (p. 75).

Many aspects of an event have been proposed as significant mediators of the life-event/health relationship, including magnitude of change required (Mueller, Edwards, & Yarvis, 1977; Ross & Mirowsky, 1979); and degrees of desirability (Chiriboga, 1977; Dekker & Webb, 1974; Vinokur & Selzer, 1975); controllability (Seligman, 1975; Suls & Mullen, 1981); and expectedness (Glass & Singer, 1972; Pearlin, 1980a,1980b).

Generally, the literature on aspects of life events documented a significant but still modest (rarely exceeding .35) increment to the average linear correlation found between life events and disturbance (Brown & Harris, 1978; McFarlane, Norman, Streiner, Roy, & Scott, 1980; Thoits, 1983). Such

findings highlighted again the limitations of straight correlational analysis which tends to overlook individual differences in stress and illness. Many people, for example, do not suffer serious deterioration subsequent to "stressful" experiences. The studies of life events and event-aspects strongly suggested a need to investigate other variables concomitantly, viz., predisposing factors, moderator variables, and multiple person-environment interaction variables, in an effort to account for subgroup variations in response to stress.

Predisposing Factors: Stress Prevention Approach

The term predisposing factors (or "risk factors") derives from a stress-prevention or stress-insulation model. These predisposing factors are hypothesized primarily to increase the likelihood of experiencing stressful events, and, secondarily, the likelihood of experiencing physical and psychological distress subsequent to events. Many sets of factors have received considerable study. Three of the most frequently studied have been: socio-economic status, prior functioning, and genetic-biological constitution. Research on socio-economic status suggests that persons of lower status experience more distress (e.g., Dohrenwend, 1973b; Hollingshead & Redlich, 1958; Kessler & Cleary, 1980; Schwab & Schwab, 1978). Two general hypotheses were advanced to account for this relationship: social selection and social causation. The

social selection hypothesis suggests that people of lower status have either a "constitutional vulnerability" (Kessler, 1979; Kohn, 1973) or less well-developed coping capacities (Brown & Harris, 1978, 1984; Kohn, 1977) that predispose them to experience greater distress both generally and subsequent to stressful events. The social causation hypothesis, on the other hand, suggests that persons of lower social status simply are exposed to a greater number and/or magnitude of stressful events (Hollingshead & Redlich, 1958; Langner & Michael, 1963; Wheaton, 1978). More recently, a third group of researchers has found evidence to suggest that the two models are not mutually exclusive (Billings & Moos, 1982: Cronkite & Moos, 1984; Dohrenwend & Dohrenwend, 1981; Thoits, 1987).

Prior physical and socio-psychological functioning has also been implicated as a predictor of the amount of stress that a person will experience (e.g., Antonovsky, 1979; Billings & Moos, 1982; Cronkite & Moos, 1984; Dohrenwend & Dohrenwend, 1978; Eaton, 1978; Hinkle, 1974). Lower levels of functioning (e.g., chronic illness, depressive mood, alcohol consumption) may lead directly to future physical or mental disorder, or indirectly to such stress-producing events as job disruption and lowering of income. Grant, Patterson, Olshen, & Yager (1987) claim, indeed, that the best predictor of future symptoms and illness is not exposure to "stress" but the presence of symptoms in the near past.

Biologic-genetic individual differences have also been proposed as mediators in the stress-health relationship. That stress can affect bio-physiological processes is well documented (Ader, 1981; Jemmot & Locke, 1984; Kannel, 1979; Mason, 1971; Riley, 1981). These bio-physiological mediators include individual differences in physiological responses to stress such as metabolic rate, cardiovascular and autonomic nervous system functioning, and immune reactions (Depue, Monroe, & Shackman, 1979; Krantz, Grunberg, & Baum, 1985; Mason, 1971). Physiological responses such as immunosuppression and hypertension, for example, put people at greater risk for illness subsequent to stress.

Gender has also been studied as a relevant biological individual difference variable that may act as a predisposing factor. Findings have varied. Several researchers found women to be more vulnerable to stress-induced illness and/or psychological distress, but have not agreed on how to explain this finding (see, e.g., Belle, 1982; Caldwell, Pearson, & Chin, 1987; Gove, 1978; Thoits, 1987). Other researchers, however, have found men to be more vulnerable. Studies, for example, that focused on a single type of stressful event have found that women adjust better than men to widowhood (Stroebe & Stroebe, 1983) and to financial difficulties (Kessler, McLeod, & Wethington, 1984), and better or as well as men to divorce (Wallerstein & Kelly, 1980).

Moderator Approach: Search for Determinants of Variation

In contrast to research on predisposing factors which is based on a stress-prevention model, another large body of research, on moderator variables, derives from two primary observations: 1) many stressors cannot be prevented; and 2) some persons can experience apparently high levels of stress and yet manifest few symptoms, while others with apparently lower levels of stress report many symptoms. Given these two observations, the hope in this body of research is to increase predictive power by discriminating subgroups in the population for whom the stress-illness relationship is especially strong or weak (Cooley & Keesey, 1981; Grant, Patterson, Olshen, & Yager, 1987.) The many moderators that have been investigated and found to have varying degrees of discriminatory power can be divided roughly into three major categories: environmental resources, personality dispositions, and coping responses.

Social support, conceived of as an external environmental supply, has received the greatest attention among the environmental variables. In this environmental context, social support generally has been indexed either by the quantity and quality of an individual's relationships (e.g., Cassel, 1974, 1976; Henderson, 1977, 1980) or by certain structural and functional dimensions of an individual's social network (e.g., Cobb, 1976; Shumaker & Brownell, 1984). The former way of indexing support has been termed the "social intimacy

approach"; the latter as the "social network approach." Researchers following both approaches have hypothesized that social support is associated with physical and psychological health/illness. The results of the studies carried out to test this hypothesis have variously provided evidence for social support having main or additive effects (e.g., Andrews, Tennant, Hewson, & Vaillant, 1978; Aneshensel & Frerichs, 1982; Williams, Ware, & Donald, 1981); interactive or buffering effects (Cobb, 1976; Dean & Lin, 1977; LaRocco, House, & French, 1980); mixed effects (Lin, Dean, & Ensel, 1986; Wheaton, 1985); or, in some cases, either no effects or negative effects on physical or psychological health (Fiore, Becker, & Coppel, 1983; Riley & Eckenrode, 1986; Rook, 1984).

Interestingly, studies following the social intimacy model generally have found social support to be associated with direct, positive effects on health. Studies from the network analysis model have found support acts as a buffer against high levels of stress. (For discussions of this issue, see Barrera, 1986, 1988; Cohen & Wills, 1985; Sarason, Shearin, Pierce, & Sarason, 1987; Wallston, Alagna, DeVellis, & DeVellis, 1983.)

Turner (1983) has suggested that three working hypotheses seem generally confirmed by studies investigating the association among environmental social support, physical and psychological well-being, and stress:

> (1) social support tends to matter for psychological well-being independent of stressor level, (2) support tends to matter more when stressor level is relatively high, and (3) the extent to which (1) and (2) are true varies across subgroups of the population defined by class level and, probably, by other variables. Further progress in resolving this issue will require that future research consider the possibility of subgroup variation.... (p. 142)

In addition to environmental variables, many personal variables have been proposed and investigated as moderators in the stress-illness relationship and found to be determinants of subgroup variation. These variables have been termed variously as personality characteristics, personal resources, resistance resources, coping resources, and vulnerability factors. Included among these variables have been: (1) attitudes about the world, including sense of coherence, sense of mastery, meaningfulness, sense of belonging, hope and trust, and fatalism (Antonovsky, 1979, 1987; Cronkite & Moos, 1984; Fleishman, 1984; Lazarus & Folkman, 1984; Pearlin, Lieberman, Menaghan, & Mullan, 1981; Thoits, 1985; Wheaton, 1983; Zika & Chamberlain, 1987); (2) attitudes about self, including self-esteem, self-efficacy, and locus of control (Bandura, 1977a,b; Cronkite & Moos, 1984; Hobfoll & Lieberman, 1987; Johnson &

Sarason, 1978; Lefcourt, 1981a, 1982; 1983; Lefcourt, Martin, & Saleh, 1984; Marsh, 1986; Rotter, 1966; Sandler & Lakey, 1982); (3) self-dispositions, including optimism, extraversion, neuroticism, and learned resourcefulness (McCrae & Costa, 1986; Rosenbaum, 1983; Hobfoll, 1985; Moos & Billings, 1982; Kessler, Price, & Wortman, 1985); (4) cognitive capacities, including intelligence, knowledge, cognitive flexibility and complexity (Kohn & Schooler, 1978; Rosenstiel & Roth, 1981; Shanan, De-Nour, & Garty, 1976; (5) interpersonal skills, including relational competence, communication skills, assertiveness, capacity for empathy (Davis & Oathout, 1987; Hansson, Jones, & Carpenter, 1984; Jones, 1985; Langone, 1979; Smith, 1968; Zika & Chamberlain, 1987; and (6) inner needs, including achievement and affiliation needs, sensation-seeking, and defenses (Cooley & Keesey, 1981; Haan, 1977; Smith, Johnson, & Sarason, 1978; Vaillant, 1977).

Many of these personal variables, such as locus of control, self-esteem, cognitive flexibility, and neuroticism are closely related to either the composite construct of hardiness or one of its components as will be seen later.

Particularly in the last ten to fifteen years, another class of variables, under the general rubric of coping processes, has also been investigated in the attempt to account for more of the variance found in stress-illness studies. Since studies on coping, however, have tended to be

atheoretical, there has been a proliferation of conceptualizations, measurement instruments, and outcome findings on coping, life events, and health outcomes. More specifically, the empirical, atheoretical approach has fostered extensive diversity in the variables that are included under the term coping and in taxonomic schemas intended to group these variables.

Early studies investigated the comparative effectiveness of specific coping efforts that people made in response to an aggregated list of life events (Andrews, Tennant, Hewson, & Vaillant, 1978), or the effectiveness of coping efforts they made to deal with very specific life events (Folkman & Lazarus, 1980; Billings & Moos, 1981; Stone & Neale, 1984; Pearlin, Lieberman, Menaghan, & Mullan, 1981; Cohen & Lazarus, 1979; Mullen & Suls, 1982; Videka-Sherman, 1982; Burgess & Holmstrom, 1979; Berman & Turk, 1981). One of the difficulties that became evident, however, with the above research was the large, unwieldy number of specific coping efforts or strategies that needed to be included for study.

Many schemas were proposed in an effort to render this plethora of specific coping strategies into a manageable number of styles of coping that could then be studied for their comparative effectiveness. Among the taxonomic schemas proposed have been: (1) problem-focused vs. emotion-focused coping (Lazarus & Folkman, 1984); (2) mature vs. immature

coping (Vaillant, 1976); (3) active-cognitive vs. active-behavioral vs. avoidance coping (Lazarus, 1966; Moos, 1977); and (4) transformational vs. regressive coping (Maddi & Kobasa, 1984). In a further effort to consolidate categories, Billings and Moos (1981) have suggested that the various schemas can be considered under two headings: (1) methods of coping, e.g., active cognitive, active behavioral, and avoidance, (Lazarus, 1966; Moos, 1977), and (2) foci of coping, e.g., emotion and/or cognition (Antonovsky, 1979; Lazarus, 1981; Pearlin & Schooler, 1978). Menaghan (1983) has offered a similar categorization. Aldwin & Revenson (1987) in a factor analytic study of coping, found a third focus of coping: combined problem-emotion focused (e.g., support mobilization).

Results of the vast majority of these studies on coping indicated several conclusions. First, coping does attenuate the effects of stress (see Lazarus & Folkman, 1984; Menaghan, 1983; Moos & Billings, 1982; Kessler, Price, & Wortman, 1985 for reviews). Second, the relative merit of any specific coping style or effort depends on many factors; for example, the nature and timing of the stressor and the resources a person possesses to deal with that stressor. Third, in order to account for the variations due to individual differences, there is need to investigate the determinants of coping styles and efforts, e.g., personality characteristics and individuals' appraisals of themselves and of events. Fourth, the

interactive effects of environmental demands and resources, personality resources, cognitive appraisals, and coping efforts must be explored.

Along with these conclusions from the coping literature, at least three major lacunae have been noted in all the previous research approaches to the study of stress and illness relationships: (1) insufficient theoretical underpinning with the consequent profusion of conflicting findings, (2) persistence in viewing stress as an external, monolithic entity best measured by use of stressful event checklists, and (3) insufficient inquiry into the mechanisms that determine relationships between resistance resources and stress.

Process Approach

The attempt to address these three lacunae has led to the process approach to the study of stress-illness relationships. The process approach incorporates and expands on the strategies employed in previous studies, but emphasizes the need to place the study of stress-illness in a larger and more theoretically-informed framework (Cronkite & Moos, 1984; Hobfoll, 1985, 1989; Holahan & Moos, 1987; Lazarus & Folkman, 1984; Pearlin, Lieberman, Menaghan, & Mullan, 1981). This framework emphasizes four related features: (1) reciprocal determinism and person-environment fit; (2) the role of subjective appraisals; (3) a more psychological view of "stress"; and (4) exploration of the determinants of relationships both between

resources and stress and between and among the resources themselves (e.g., How do personality characteristics influence choice of coping responses?)

The first feature includes the concepts of reciprocal determinism and person-environment fit. Under the model of reciprocal determinism, persons are regarded, not as engaged in the passive reception of environmental stimuli, but as active construers of their world and of themselves. Further, there is constant feed-back and feed-forward of information between the initiatives and responses of both the individual and the environment (McGrath, 1970; Bandura, 1977a; Endler & Magnusson, 1976). The person-environment fit concept emphasizes that degree of experienced stress depends in large part on the degree of "fit" (1) between a person's current adaptive resources and needs and the particular environmental demand, and (2) among the individual's own personal dispositions, needs, skills, and social resources (Dawis & Lofquist, 1984; French, Rodgers, & Cobb, 1974; Murray, 1938; Lewin, 1938).

The second feature of the process approach emphasizes the role of cognition in dealing with stress and change, and hence on individual differences. The important role of cognitive appraisal in dealing with stressful events has been well delineated in works by McGrath (1970) and Meichenbaum (1977), and documented in studies by Lazarus and his colleagues (Lazarus & Folkman, 1984; Lazarus & Launier, 1978.). "Events"

are not simply objective, external demands that have existence apart from a person's perception of them. Their meaning and salience for any individual depend, for example, on the individual's appraisal of the degree of threat posed by the event ("primary appraisal") and the individual's appraisal of his or her own capacities and skills to cope with the event, ("secondary appraisal").

The third feature involves a new, psychological conceptualization of stress. This new conceptualization defines stress as resulting from an imbalance between perceived demand and perceived response capacity (Lazarus, 1981; McGrath, 1970; Rutter, 1981). At least two important corollaries are linked to this conceptualization. First, only events perceived as threatening can lead to negative psychological effects (Lazarus & Launier, 1978; Pearlin, Lieberman, Menaghan, & Mullan, 1981; Thoits, 1985). Second, "stress" defined as change, is not always negative. As McGrath (1970) puts it: "One man's stress is another man's challenge" (p. 17). (For a discussion of the possible one-sidedness of this conceptualization, see Hobfoll, 1985, 1989.)

The fourth feature of the process paradigm emphasizes the need to identify the <u>determinants</u> of the relationships among variables in the stress process. What are the determinants of, for example, cognitive appraisals made, coping strategies selected, and levels of environmental support received?

Researchers following the process approach have begun to explore the mediating role played by several classes of determinants that affect or channel cognitive appraisals and coping responses. One class of determinants studied has been personality characteristics (Fleishman, 1984; Holahan & Moos, 1987; McCrae & Costa, 1986; Parkes, 1986; Sarason, Sarason, & Shearin, 1986; Wheaton, 1982). Such characteristics as locus of control, self-esteem, sense of meaning, and sense of mastery (all of which resemble components of the hardiness construct) have been identified as determinants. Individuals, for example, with high self-esteem tend to perceive less threat in situations and, therefore, less stress, and also possess a greater confidence in their capacity to handle whatever threat does exist (Fleishman, 1984; Pagel & Becker, 1987; Pearlin & Schooler, 1978).

A second class of determinants that has been explored is socio-economic status, and levels of education and income. Eron & Peterson (1982) explored how lower socio-economic status affects the acquisition and use of social skills (relational competence) and other coping resources. Worden & Sobel (1978) found a positive relation between socio-economic status and ego-strength. George (1980), Kohn & Schooler (1978), and Shanan, De-Nour, & Garty (1976) have found, respectively, that more education fostered: (1) increased cognitive complexity which, in turn, fostered less threat appraisal and more coping

skills; (2) more positive self-perceptions; and (3) increased cognitive flexibility. Holahan & Moos (1987) found income and education negatively correlated with use of avoidance coping and positively correlated with use of active-behavioral coping.

Finally, the emphasis in the process approach on the role of cognitive appraisal has led to the exploration of what might be called person-based beliefs. Such beliefs have been shown to act as empirically-separable, mediating constructs that have independent, as well as interactive, effects on coping and adjustment. Such constructs include general personal commitments and beliefs (e.g., concerning religion, family, and self-actualization) and more specific beliefs such as (1) perceived self-efficacy, (2) perceived coping efficacy, and (3) perceived social support.

Bandura (1977b, 1982) defined perceived self-efficacy as confidence in one's capacity to behave or cope effectively, and he hypothesized that it acts as a cognitive determinant of whether a person will initiate coping action and how much effort and perseverance he or she will exert. The underlying tenet is that people will not attempt to change their behavior unless they feel capable of doing so. Researchers following Bandura have begun to confirm that efficacy expectations are related to predicting change in certain clinical problems, to types and range of careers a person considers, and to perseverance and success in educational programs (see Lent,

Brown, & Larkin, 1984 for review). Holahan and Moos (1987) have argued that perceived efficacy is also related to type of coping strategy selected. People with low self-efficacy, for example, tend to engage in more avoidant coping; whereas high self-efficacy is associated with more active-cognitive and behavioral coping.

Second, Aldwin and Revenson (1987) have explored perceived coping efficacy. They define coping efficacy as the perception that one has coped effectively with events, and they distinguish this variable from coping effectiveness which they see as related to outcome measures. Results of their study suggest that perceived coping efficacy acts as an intermediate step between coping and mental health, just as perceived self-efficacy acts an intermediate step between the person and coping.

Third, there has been much research on perceived social support. The process-oriented approach has conceptualized support as a socio-psychological resource which consists of a generalized appraisal that individuals develop as to how much they are cared for and valued, how available others are to help them in time of need, and how satisfied they are with their relationships (Heller, Swindle, & Dusenbury, 1986; Procidano & Heller, 1983). Studies have demonstrated that perceived support is positively correlated with indices of physical and psychological health (For reviews, see Cohen & McKay, 1984;

Cohen & Wills, 1985; Kessler & McLeod, 1985; Thoits, 1982). Further, perceived support has been shown to be both empirically separable from measures of social network characteristics (Cutrona, 1986; Heller & Swindle, 1983), and more directly related to the enhancement and maintenance of well-being than network measures (Cohen & Wills, 1985; Henderson, Byrne, & Duncan-Jones, 1981; Sandler & Barrera, 1984; Wilcox, 1981). Recent studies have also suggested that measures of perceived support: (1) are more indicative of good adjustment than even a measure of actual support received (Sarason, Shearin, Pierce, & Sarason, 1987); (2) appear to hold good despite the veridicality of the perception (Sarason, Shearin, Pierce, & Sarason, 1987; Wethington & Kessler, 1986), and (3) remain fairly stable across time, suggesting that perceived support is an individual difference variable (Sarason, Sarason, & Shearin, 1986).

Most recently, Brown and his colleagues (Brady, Wolfert, Lent, & Hall, 1987; Alpert, & Lent, 1988), pointing to the atheoretical nature of previous studies of support, have suggested a specific theory and have identified specific theoretical components that may constitute a person's perception of support. Brown and his colleagues have also developed and begun to assess a theoretically based instrument (the SSI-PF) to measure perceived satisfaction with support. This measure has provided a way to measure individual

differences in perceived support, and made possible a process-oriented research program that would explore the further question of the developmental-personal correlates and antecedents of both the strength of a person's need for support and his/her appraisal of the quantity and quality of support received.

The Conceptualization of Personality Hardiness

As mentioned in chapter one, a recent research program that has been influenced by all of the strategies described above (especially the process approach) and that has received considerable attention in the literature is the work of Kobasa and her colleagues on the "hardy personality" (Kobasa, 1979a; 1982b; Kobasa, Maddi, & Courington, 1981). The construct of hardiness has been proposed as a person-based moderator (determinant) that comprises fundamental personality dispositions that together or singly may: (1) act as a positive predisposing factor either by reducing the number of stressful events experienced or by decreasing the capability of such stressful events that are experienced to produce strain and illness; (2) may affect both primary appraisals of the degree of threat involved in events and secondary appraisals of one's capacity to meet those events; (3) may be correlated with the adoption of a general type of coping style (transformational) and specific coping responses; (4) may be associated with better health practices; and/or (5) may interact with other

moderators to further prevent or reduce stress; e.g., persons who are "hardy" may feel more supported and may more effectively mobilize social support when needed (Kobasa, 1982b; 1985; Kobasa, Maddi, Donner, Merrick, & White, 1984).

Having noted that early stress research focused on the pathological sequelae of stress, and generally found low correlations between stress and illness due in large part to wide individual differences, Kobasa shifted the focus of stress research from exploring why some people are vulnerable in the face of stress to why some people remain more invulnerable. Or, in the vocabulary of research on predisposing factors, she wished to explore not susceptibility but resistance factors. As precedent, she noted that many researchers have overlooked one of the hypotheses in Selye's early work: that some people can safely seek out stress without becoming ill (Kobasa, 1982b).

Instead of viewing people as relatively passive and inflexible in the face of stress, Kobasa, following the reciprocal determinism model, has focused on human initiative and resilience. She has emphasized that people create as well as react to stressful life events and that people can thrive on as well as tolerate stressful situations (Kobasa, 1982b). She has pointed to work by earlier theorists who emphasized the same active role that people do or can play in their lives. She noted, for example, the work of James on "strenuousness"

(1911); Fromm on "productive orientation" (1947); Allport on "propriate striving" (1955); White on "competence" or "effectance-motivation" (1959); Bandura on "self-efficacy" (1978); and Brehm on "reactance" (1966). Kobasa has also noted similar themes of resilience, capacity to exercise control over life events, and the perception of life-changes, not as crises, but as welcome challenges to one's abilities in the work of Lefcourt (1973); Neugarten and Datan (1974); and Rodin and Langer (1977).

Kobasa proposed that personality is a highly significant determinant of stress resistance. She felt that such fundamental aspects of personality as general orientation toward life and characteristic interests and motivations are what ultimately influence how any event is appraised and dealt with, and, thereby also determine the ultimate impact of any event on one's well-being. Her research goal is, then, to identify the conscious psychological processes by which persons efficiently recognize and act on their situations (Kobasa, 1982b; 1985). She felt that earlier research had either altogether neglected personality as a determinant, or had proceeded on an empirical but atheoretical track. In the case of the latter, she felt that researchers had reduced the exploration of a link between personality and health to empirical studies that explored the effect of single variables, which are conceptually separated from personality, on illness

susceptibility in response to stress; for example, the effect of locus of control on the occurrence of illness-susceptibility. The emphasis in these studies, she felt, was more on what scales to use to measure the variables and whether or not a correlation could be found, than on why such a variable would be worth exploring in the first place. Kobasa intended to pursue a program of research that would explore the role of theoretically elaborated personality dispositions as resistance factors in the face of stress. She thereby hoped to further an understanding of the role of relevant underlying psychological processes in the stress-illness domain.

In order to find theoretically elaborated personality characteristics that might act as positive resistance resources, Kobasa turned to two fundamental and related concepts found in existential personality theory, particularly as expounded by Maddi (Kobasa & Maddi, 1977; Maddi, 1967, 1970). First, people are "thrown" unformed into a world that does not offer ready-made meanings, values, or goals. Consequently, people are always constructing themselves and their world, and in this process must always face change and adaptation. Further, people carry the responsibility for their own growth. Second, no one lives in an intrapsychic vacuum. People unavoidably exist in relationship with other people. The character and meaningfulness of these relationships, however, are the responsibility of each person. In these two

fundamental concepts, Kobasa found the theoretical underpinning for three personality dimensions that she termed commitment, control, and challenge. The construct of commitment is based on the idea that people must take responsibility for creating a meaningful community with others. Control is based on the idea that people are both responsible for and capable of constructing their "selves" and their world. Challenge is based on the idea that people can courageously accept and interact with a world where change and ambiguity, not stability and security, are the norm of life. These three constructs, taken together, constitute the "hardy personality."

Kobasa has offered more detailed descriptive definitions of each of the three component constructs of hardiness (see Kobasa, 1979a, 1979b, 1982a; Kobasa, Hilker, & Maddi, 1979; Kobasa, Maddi, & Kahn, 1982). The following descriptions, as mentioned in chapter one, represent a summary of the delineation of each construct.

Commitment is described as including the following: (1) meaningful involvement in one's self, work, family, friendships, and larger community; (2) a sense of purpose and direction; (3) a belief in who one is and what one is doing; (4) a prioritized set of autonomously chosen values; (5) an ability to find meaning in all experiences; (6) a sense that one is being counted on by others; and (7) a sense of basic trust in the world.

Control is described as including: (1) the belief that one can direct and/or influence events; (2) the belief that one's self is the primary influencer and/or director of events; (3) the tendency to seek explanations for the cause of events in oneself; (4) a sense that one can act and make decisions on one's own; (5) a sense of personal responsibility in one's interactions; (6) a capacity for cognitive control, or the ability to effectively interpret, appraise, and incorporate events into an ongoing life plan; and (7) the possession of a flexible coping repetoire developed through a characteristic motivation to achieve.

Challenge is described as including: (1) a view that change represents an opportunity for growth rather than a threat to security; (2) cognitive flexibility or openness, and an ability to tolerate ambiguity; (3) a desire to seek new experiences; (4) a familiarity with where one could turn for supportive resources; (5) a deliberate practicing to respond to the unexpected; and (6) a realized capacity to be a catalyst in one's environment.

Kobasa regarded these component constructs of hardiness to incorporate both a cognitive and a behavioral dimension. The cognitive dimension of hardiness represents a general, optimistic belief system about self and world. The behavioral dimension represents the way that hardy people actually engage the world. Hypothetically, hardy people engage in

"transformational coping," as opposed to "regressive coping" (Kobasa, Maddi, Donner, Merrick, & White, 1984; Maddi & Kobasa, 1984). Kobasa and her colleagues describe regressive coping as the tendency to react to stress by such means as denial, avoidance, anger, apathy, drinking, and medication. Transformational coping, on the other hand, is more vaguely described as actively finding decisive ways to transform stressful events into opportunities for personal and societal growth. If such direct transformation is not possible, then transformational coping involves changing the events in a less stressful direction through optimistic cognitive re-appraisals that place the event in some meaningful perspective. In relating their notion of coping to the literature, Kobasa and her colleagues (1984) compared regressive and transformational coping to Folkman and Lazarus' (1980) distinction between emotion-focused and problem-focused coping respectively. Transformational coping is characterized as attempts to directly address the problem at hand, whereas regressive coping is characterized as attempts to assuage one's emotions. This contrasting characterization seems not altogether apt, however, since Folkman and Lazarus do not equate emotion-focused coping necessarily with regressive attempts to assuage emotions and deny reality. On the other hand, the transformational versus regressive distinction does bear resemblance to the distinction between mature and immature coping or defense found in the work

of psychoanalytically-oriented writers (e.g., Vaillant, 1976), and to the distinction between active and avoidant coping styles made by Lazarus and Folkman, 1984.

Kobasa and her colleagues also have suggested that hardiness may be a developmental variable by hypothesizing that certain types of early life experience may antecede and make possible the achievement of hardiness in adult life (Maddi & Kobasa, 1984). Pointing to infant and early childhood studies (McClelland, 1951; Ribble, 1944; Spitz, 1945, 1946; Thompson & Schaefer, 1961), Maddi and Kobasa include among possible antecedents of hardiness such experiences as secure attachment to parents (leading toward commitment); gentle, phase-appropriate pushes by parents toward autonomous exploration and manipulation of the environment (leading toward control); and a rich early environment that provides an optimum amount of stimulation and multiple opportunities to exercise creative imagination, judgment, and social skills (leading toward challenge). Studies on alienation, conversely, have found evidence suggesting that separation anxiety (Sarason & Sarason, 1982) and disillusionment with an important relationship to which one once felt committed (Stokols, 1975) predict alienation in later life.

The Operationalization of Hardiness: Initial Measures

While Kobasa conceptualized the hardiness constellation as composed of the three interconnected components of

commitment, control, and challenge, she operationalized and measured the components negatively as alienation, absence of a sense of control, and security orientation.

The following scales represent the original indices that Kobasa employed to measure hardiness in her initial study.

The component of commitment was measured by six subscales from two instruments:

(1) the Work subscale of the Alienation Test (Maddi, Kobasa, & Hoover, 1979)

(2) the Self subscale of the Alienation Test

(3) the Family subscale of the Alienation Test

(4) the Interpersonal subscale of the Alienation Test

(5) the Social Institutions subscale of the Alienation Test

(6) the Role Consistency Test, adapted from the Self-Consistency Test (Gergen & Morse, 1967)

Control was measured by six scales from four instruments:

(1) the Internal vs. External Locus of Control Scale (Rotter, Seeman, & Liverant, 1962)

(2) the Powerlessness vs. Personal Control scale of the Alienation Test (Maddi, Kobasa, & Hoover, 1979)

(3) the Nihilism vs. Meaningfulness scale of the Alienation Test

(4) the Achievement scale of the Personality Research Form (Jackson, 1974)

(5) the Dominance scale of the Personality Research Form

(6) the Leadership Orientation scale of the California Life Goals Evaluation Schedule (Hahn, 1966)

Challenge was measured by six scales from three instruments:

(1) the Preference for Interesting Experiences scale of the California Life Goals Evaluation Schedule

(2) the Security Orientation scale of the California Life Goals Evaluation Schedule

(3) the Vegetativeness vs. Vigorousness scale of the Alienation Test

(4) the Adventurousness vs. Responsibility scale of the Alienation Test

(5) the Need for Cognitive Structure scale of the Personality Research Form

(6) the Need for Endurance scale of the Personality Research Form

The Alienation Test (Maddi, Kobasa, & Hoover, 1979) is a 60-item, Likert type measure intended to index four subtypes of alienation in five contexts. The four subtypes of alienation are: 1) powerlessness, or the feeling of having no control over

one's social or personal affairs; 2) nihilism, or the consistent attempt to discredit anything that appears to have meaning; 3) vegetativeness, or the inability to believe in the truth, importance, or interest value of anything that one is doing; and 4) adventurousness, or the inability to feel alive unless one is engaged in extreme and even dangerous activities. Fifteen items are intended to index each of these subtypes. The five contexts of alienation are: 1) self, 2) work, 3) family, 4) other persons, and 5) social institutions. Twelve items are intended to cover each of these contexts. Cronbach's alpha for the alienation types and contexts ranged from .75 to .95. A comparison of obtained scores on the initial testing with a re-administration of the test after three weeks revealed a mean product-moment correlation of .64, reflecting moderate but adequate stability. Correlations among the types and contexts were all positive and ranged from moderate to high. Several construct validity studies were conducted, showing that persons who scored high on alienation tended to have an external locus of control, to experience a lack of purpose and meaning, greater anxiety, difficulty empathizing with others, and inconsistency among their various roles in life. These tendencies were least marked for the subtype of adventurousness, more marked for nihilism, and strongest for powerlessness and vegetativeness. The adventurousness subtype was associated with an increased interest in novel experiences.

Maddi thus suggests the importance of differentiating contexts and types of alienation.

Each of the three scales employed by Kobasa from the California Life Goals Evaluation Schedule (Hahn, 1966) is a 15-item, Likert-type measure. The Leadership Orientation scale is intended to index the degree of motivation to direct and have control of others through partial, or total, consent of those so directed or controlled. The Preference for Interesting Experiences scale is intended to index motivation: 1) to experience constant change consistent with one's interests; 2) to enter into situations and conditions which present new, or different, problems to be solved; and 3) to explore and manipulate one's physical and social environments. The Security Orientation scale is intended to index the degree to which a person 1) looks to society and/or government to guarantee various forms of economic security, and 2) puts priority on freedom from present and future threats to physical and social survival.

All of the scales of the Personality Research Form (Jackson, 1974) are intended to measure traits adapted from the theoretical writings of Murray (1938). The Achievement, Dominance, and Endurance scales seem self-evident and not in need of clarification. The Need for Cognitive Structure scale is an index of a person's degree of cognitive inflexibility and lack of tolerance for ambiguity.

The Role Consistency Test adapted from the Self-Consistency Test (Gergen & Morse, 1967) was used to index the degree of compatibility among a person's self-reported five most important life roles. These life roles were intended to correlate with the five contexts of alienation.

Operationalization of The Hardiness Constellation: Research

Kobasa (1979a) formulated three hypotheses to be tested in her research.

Hypothesis 1: Among persons under stress, those who feel committed to the various areas of their lives will remain healthier than those who are alienated.

Hypothesis 2: Among persons under stress, those who have a greater sense of control over what occurs in their lives will remain healthier than those who feel powerless in the face of external forces.

Hypothesis 3: Among persons under stress, those who view change as a challenge will remain healthier than those who view it as a threat.

To first test these hypotheses, Kobasa (1979a, 1979b) mailed slightly modified versions of the Schedule of Recent Life Events (Holmes & Rahe, 1967) and of the Seriousness of Illness Survey (Wyler, Masuda, & Holmes, 1968) to a group (N=837) of white, male, middle and upper level executives at a Midwestern utility company. From the 670 subjects who returned completed questionnaires, Kobasa randomly selected groups of

100 high stress/high illness subjects and 100 high stress/low illness subjects. These 200 subjects were then sent a composite questionnaire composed of the 18 subscales presumed to index hardiness. Along with this questionnaire, Kobasa sent a short set of "perception of stress" items. These items asked subjects to rate on a scale of 1 to 7 the degree of stress that they felt in six areas of their lives: work, finances, family, interpersonal relationships, social/community involvements, and personal or inner-life concerns.

86 high stress/low illness subjects and 75 high stress/high illness subjects returned completed personality questionnaires. Forty "test" subjects were randomly selected from each group for analysis of differences across personality, demographic, and perception variables. The remaining 81 subjects were set aside for cross-validation.

In this study of executives, a stress-illness Pearson product-moment correlation of .24 ($p < .025$) was obtained, indicating that some subjects who experienced high stress did not experience high illness. This weak, but statistically significant, correlation is consistent with most prior studies reviewed earlier in this chapter.

Kobasa employed *t*-tests and discriminant function analysis to further specify the differences between the high stress/high illness and high stress/low illness groups. *T*-tests of mean differences between the test subjects of the two

groups revealed significant values for the following seven variables, listed in descending order of t-value: (1) alienation from self; (2) nihilism, (3) perception of personal stress, (4) powerlessness, (5) external locus of control, (6) vegetativeness, and (7) adventurousness.

Kobasa then submitted all 19 variables to discriminant function analysis in order to select the best combination of variables for explaining the differences between groups. Eleven of the variables combined to form a significant discriminant function. The eleven, in descending order of standardized coefficients, were: (1) alienation from self, (2) vegetativeness, (3) nihilism, (4) perception of personal stress, (5) alienation from work, (6) leadership, (7) achievement, (8) security, (9) role consistency, (10) external locus of control, and (11) cognitive structure.

Using the unstandardized discriminant function coefficients, the discriminant function equation was employed to predict subjects' membership in one of the two groups. An average of 78% of the cases were correctly classified in the test sample used to derive the equation ($p < .025$; $N=80$). An average of 68% of the cases were correctly classified in the cross-validation sample ($p < .05$; $N=81$).

Kobasa drew two conclusions from the results of this initial study. First, personality does play a role in keeping people healthy despite the experience of stress. Second, given

the composition of the discriminant function equation, high stress/low illness subjects were, at least in some ways, more committed, more in control, and more oriented to challenge than the high stress/high illness subjects. Specifically, by inspecting which variables contributed most to the discriminant function equation and produced significant t-values, she found five variables to be the best discriminators between those who remain healthy and those who become ill: (1) alienation from self, (2) vegetativeness, (3) nihilism, (4) external locus of control, and (5) perception of personal stress.

To test the generalizability of this first study's findings, Kobasa conducted studies on two other professional groups: Army officers (1981) and lawyers (1981, 1982a). The 75 Army officers in this study were all enrolled in a midwestern university preparing for assignments as R.O.T.C. instructors. Kobasa (1981) states that these officers were given all of the same instruments as had been given the executives. The officers' reports showed a correlation of .56 ($p < .001$) between stressful life events and physical illness, and of .60 ($p < .001$) between stress and psychiatric illness.

With physical illness as the criterion, a stepwise regression analysis revealed that magnitude of stressful life events was the most powerful predictor, but that security orientation and degree of alienation were also significant predictors ($R^2 = .50$, $F = 11.42$, $p < .01$). Those officers who

reported greater physical symptomatology tended to be those higher in alienation but, curiously, lower in security orientation.

With psychiatric symptoms as the criterion, the most powerful predictors were external locus of control, powerlessness, and alienation; amount of stress remained a significant predictor, but a weaker one (R^2 =.82, F =48.9, p <.001).

To study the role of the hardiness constellation among 157 general practice lawyers, Kobasa (1981, 1982a) used the Powerlessness and Vegetativeness subscales of the Alienation Test to index degree of alienation/commitment. The dimensions of locus of control and security orientation were not measured. In addition, ad hoc constructed indices of regressive coping, perceived social support, and physical fitness were used as predictors, along with amount of stress. Strain was added to illness as a second criterion variable. With diagnosable illness as the criterion, results of an hierarchical stepwise regression analysis indicated that neither the personality variables nor the other coping and resource variables were significant predictors. With strain as the criterion, however, the regression analysis indicated that alienation (powerlessness and vegetativeness) and the use of regressive coping were the most powerful predictors. Additionally, alienation had a direct effect on strain, and an indirect

effect by increasing the use of regressive coping strategies. The perceived social support variable made only a slight contribution to the regression equation (R^2 change of .016), and did so in the direction opposite of that predicted. Exercise had no impact. No investigation using psychiatric symptoms as the criterion is reported in Kobasa, 1982a. However, the other article describing the lawyer study, (Kobasa, 1981), does report the findings of a stepwise regression analysis with psychiatric symptomatology as the criterion. The analysis revealed that lawyers' psychiatric symptoms can be predicted best by a combination of style of coping, alienation, and stress (R^2 =.55, F =24.20, p <.001). The most powerful predictors were degree of regressive coping and alienation.

Kobasa concluded that these two studies, while revealing some differential effects for the components of the hardiness constellation among the three professional groups, did lend support to the generalizability of the findings from the initial study of business executives.

The previous studies represented retrospective research, and therefore, did not begin to address the issue of time and/or "causal" sequence. Do certain personality characteristics reduce or prevent stressful events and subsequent symptomatology? Or, does symptomatology lead to more stressful events and then to subsequent personality

attitudes of alienation and powerlessness? In order to address this issue of whether the hardiness constellation protects against future illness, Kobasa and her colleagues conducted two non-independent studies involving the use of longitudinal designs and covariance analysis.

In both of these studies, Kobasa employed a subset of scales different from those used in the previous studies to index the "multifaceted style" of the hardiness constellation (Kobasa, Maddi, & Courington, 1981). The Alienation from Self and Alienation from Work scales were used to index alienation; the External vs. Internal Locus of Control scale and the Powerlessness scale to index control; and the Security Orientation scale and the Need for Cognitive Structure scale to index security. These six scales had been among those scales found either to have contributed significantly to the original discriminant function equation or to have had a significant t-value or both.

While analyzing the data from these prospective studies, however, Kobasa noted that the cognitive structure subscale had very low, and often negative (-.06 to .15), correlations with the other subscales (which were moderately to highly intercorrelated). She therefore conducted a principal components analysis on these scales. She found that a first component emerged that accounted for 46.5% of the total variance. From an inspection of the coefficients of the

various scales with this component, it was clear that cognitive structure (coefficient of -.01) did not share common variance with the other scales. Indeed, it apparently represented a second component, accounting for 18.5% of the total variance. Further, Cronbach's alpha (using subscale scores as items) increased from .59 to .73 when this subscale was deleted. The cognitive structure scale was, therefore, dropped from subsequent consideration.

Kobasa labeled the first, large component "General Hardiness," and decided to employ the remaining five scales as a composite index of hardiness. Z scores were computed for these five scales and then were summated to achieve a single, negative index. Since the challenge dimension was indexed by only one scale (security), its score was doubled. This new, composite hardiness index was, therefore, used in these prospective studies, and continued to be used in subsequent studies by Kobasa and her colleagues.

The first prospective study (Kobasa, Maddi, & Courington, 1981) was carried out on a final sample of 259 subjects from the executive group used in an earlier study. Constitutional predisposition (as measured by parents' illness scores) was included as an independent variable along with stress and hardiness measures. Subjects' reported illness was measured at three intervals, each separated by one year. An analysis of variance was conducted with stressful life events, the

hardiness composite, and parents' illness (all derived from time 1 or before) as the independent variables. All of the independent variables were split at the median to form low and high groups. Illness scores summed over times 2 and 3 served as the dependent variable. Results indicated that stress and constitutional predisposition were associated with increased illness reports, whereas the composite hardiness score was associated with decreased illness reports. An analysis of covariance, with prior illness as the covariate, indicated that whereas stress no longer had a significant main effect, the hardiness composite and constitutional predisposition did. No interactive effects were found.

The second study (Kobasa, Maddi, & Kahn, 1982) employed the same sample of subjects and the same design as the previous study, except that constitution was not included. Two analyses of covariance were performed, both using reported illness summed over times 2 and 3 as the dependent variable. The first analysis measured stress concurrently and hardiness prospectively with illness. Results indicated that stress was associated with increased illness, and the hardiness composite with decreased illness. An interactive effect was also found showing hardiness to be more important under conditions of higher stress. The second analysis measured both stress and hardiness prospectively. Results indicated that stress no longer had a significant main effect, but hardiness did. The

stress x hardiness interaction also appears to have persisted, though Hull, Van Treuren, and Virnelli (1987) have pointed out that the F-statistic as reported for this interaction contains incompatible values.

Kobasa's two major conclusions from these prospective studies were: (1) hardiness seems to function prospectively as an important protection against illness, and (2) hardiness seems to have its greatest effect under conditions of higher stress.

In a series of four other studies, Kobasa and her colleagues assessed the effects of hardiness in relation with various other stress-resistance resources on reported illness scores (Kobasa, Maddi, & Puccetti, 1982; Kobasa, Maddi, & Zola, 1983; Kobasa & Puccetti, 1983; Kobasa, Maddi, Puccetti, & Zola, 1985). All four of these studies used subjects from the original business executive group, though it is not clear whether the same or different samples were tested. In all four, the 5-scale, composite hardiness index was employed.

All four studies found that composite hardiness, with one exception, functioned independently of and additively with the other stress-resistance resources measured: exercise, absence of Type-A personality characteristics, social assets, and perceived social support. The one exception was an obtained correlation of .29 between hardiness and perceived boss support (a subscale of Moos' environment scales, 1974). Each of the

studies found that the more resources one has, the more protected he/she is from illness. Relative to the other resistance resources, however, the hardiness composite was the most strongly associated with fewer reports of illness.

Research by Others on the Hardiness Constellation

Research by others has been characterized by great variation in the index employed to measure hardiness, and has addressed three not unrelated major issues: (1) the manner in which hardiness has its effects (directly, as a moderator, or as a mediator variable); (2) the construct validity of hardiness; and (3) the dimensionality of hardiness.

Multiplicity of hardiness indices

Studies conducted by other researchers have used six different indices to measure the hardiness construct. Such inconsistency has made comparisons among them and between them and Kobasa's studies difficult. Several researchers used the six-subscale, 93-item version used by Kobasa in her early studies; several used the five-subscale, 71-item version already mentioned as employed by Kobasa in her later published studies; one used the Alienation Test of Maddi; one used three items from the Rotter Locus of Control Scale; several used a three-subscale, 36-item revised Hardiness Scale; several used a three-subscale, 20-item abridged Hardiness Scale, and one used both the abridged and the revised. These latter two indices have not been published in the general literature; they have

been shared by Kobasa with other researchers through personal communications. Rhodewalt and Agustsdottir (1984), Rhodewalt and Zone (1989), and Allred and Smith (1989), for example, refer to personal communications (June and July, 1982) as their source of access to the abridged Hardiness Scale developed by Kobasa. Similarly, Hull, Van Treuren, and Virnelli (1987) refer to a personal communication (November 1, 1982) as their source of access to the revised Hardiness Scale developed by Kobasa.

Rhodewalt and Zone (1989) and Allred and Smith (1989) report that Kobasa selected the twenty items of the abridged version on the basis of their high correlations with total scale scores on the original, unabridged hardiness measure and their coverage of the three major subdomains of the hardiness construct: 5 items for challenge, 6 for commitment, and 9 for control. Cronbach's alpha for the scale was reported by Kobasa as .81. They also report that Kobasa found a correlation of .89 between the abridged and unabridged forms, and that Kobasa was able to replicate all of the hardiness findings in her previous studies when scores from the abridged form were substituted for the unabridged scores.

Hull, Van Treuren, and Virnelli (1987) report that the 36-item revised version was developed by Kobasa and her colleagues on the basis of a second, unpublished principal components analysis with oblique rotation conducted on the

items from the original, unabridged, six-subscale hardiness measure. Three components were extracted, and only those items with coefficients greater than .30 on one and only one component were retained (Kobasa and Maddi, personal communication, November 1, 1982). Allred and Smith (1989) report that Cronbach's alpha for this version is .59 when the cognitive structure subscale was included, and .73 when excluded. They further report that Kobasa found a correlation of .89 between the revised form and the unabridged form, and that she successfully replicated all hardiness findings in previous studies substituting the scores from the revised form. In their own study, Allred and Smith found a correlation of .50 between the abridged and the revised forms "in spite of the fact that the scales shared only nine items and were administered an average of 6 weeks apart" (p. 259). This revised version has subsequently been employed sometimes as a composite of five subscales, sometimes of six.

How hardiness has its effects

Tests by various researchers on how hardiness has its effects on illness or illness reports have produced inconsistent results. Five studies by Kobasa and her colleagues that tested for the effects of hardiness on illness reports consistently found direct effects for hardiness on illness reports, but did not consistently find interactive or buffering effects. The prospective study by Kobasa, Maddi, and

Courington (1981) found no significant interaction between stressful life events and hardiness. The other prospective study (Kobasa, Maddi, & Kahn, 1982) did report a significant interaction, but the values for the reported F-statistic { F (1,254) = 3.48, p =.05} are incompatible as pointed out by Hull, Van Treuren, and Virnelli (1987). If one assumes that the F-value is correctly reported, then the interaction did not achieve the .05 level of significance. It may be possible, however, that the reported value of 3.48 is a misprint for 3.84; if this is the case, then this value would be just sufficient for the .05 level of significance. These two prospective studies were not, however, independent tests since they both tested the same data from the same sample. The study on hardiness and exercise (Kobasa, Maddi, & Puccetti, 1982) found a significant interaction between stressful events and hardiness on illness reports (p =.02), no significant interaction between hardiness and exercise, and no significant three-way interaction.

The study on Type-A and hardiness (Kobasa, Maddi, & Zola, 1983) did not find a significant F-value for a hardiness interaction. A three-way ANOVA "approached conventional significance," and planned comparisons suggested that hardiness moderated the relationship between Type-A and illness. The fifth study to test for effects (Kobasa & Puccetti, 1983) found

no significant interaction between hardiness and stressful events or between hardiness and social resources.

Findings by other researchers have likewise shown inconsistent results. Employing the 5-subscale, unabridged version of the hardiness measure, studies by Schmied and Lawler (1986) on hardiness, type-A behavior, and the stress-illness relationship among working women and by Singer and Rich (1985) on hardiness, stress, and social support among male and female undergraduates did not find evidence for any moderating effects of hardiness on reported illness. A study by Banks and Gannon (1988) on major stressful events, hassles, hardiness, and reports of psychosomatic symptoms among male and female undergraduates employed the abridged version of the hardiness measure. Banks and Gannon found that hardiness decreased the development of symptoms and acted as a buffer against symptoms under higher stress and hassles levels. Ganellen and Blaney (1984), using the six-subscale Alienation Test on a sample of female undergraduates, found direct effects on depression scores (BDI; Beck, 1967) for only two of the components of the Alienation Test: alienation from self and vegetativeness. They also found a significant interaction between life stress and the alienation from self component on BDI depression scores. No significant interactions between hardiness and stress were found for any of the other components of the Alienation Test

and no significant interactions were found for any hardiness component and social support.

A second set of studies have suggested that the effects of hardiness on health and illness may be mediated by optimistic appraisals, an adaptive cognitive style, a specific attributional style, and/or by better health practices. First, Banks and Gannon (1988) found that hardiness moderated the physical symptom effects of high levels of hassles, but also found that hardy people: reported fewer life events and hassles, and rated hassles, though not life events, as less severe than low hardy people did. The authors therefore hypothesized that hardy people may be characterized by their optimistic appraisals of the world, reflected in their tendency to minimize the impact of negative events. Roth, Wiebe, Fillingim, and Shay (1989) found a small but significant relationship between hardiness and illness reports. Regression analyses, however, revealed that hardiness had no independent effects on health, and did not moderate the effects of negative stressful events. Path analyses, on the other hand, suggested that the health effects of hardiness may be mediated by either fewer experienced or fewer perceived negative events. Third, Rhodewalt and Agustsdottir (1984) found that high and low hardy people were equally likely to experience a stressful event, but that high hardy persons, on average, were more likely than low hardy persons to perceive events as desirable and controllable,

and to suffer less attendant psychological distress. Likewise, Rhodewalt and Zone (1989) found that high and low hardy people experienced the same number of events, but the high hardy persons reported significantly fewer events as undesirable, unchangeable, and/or uncontrollable and suffered less attendant depression or illness. Third, Allred and Smith (1989) found that high hardy people reported fewer negative thoughts across both high and low stress levels than did low hardy people. When neuroticism was controlled, however, the hardiness main effect was eliminated. On the other hand, high hardy people endorsed more positive self-statements under high stress conditions than did low hardy people. This interaction involving positive statements remained significant when neuroticism was controlled. The authors interpret these results as evidence that hardy people suffer less stress-induced illness because of their adaptive cognitive style and subsequent reduced levels of physiological arousal. Fourth, Hull, Van Treuren, and Propsom (1988) found evidence suggesting that the effects of hardiness on illness may be mediated by an attributional style characterized by more internal, stable, and global attributions for positive events and more external, unstable, and specific attributions for negative events. This pattern of attributions was, however, strongest for the commitment component of hardiness; similar but weaker for the control component; weaker and in the opposite direction for the

challenge component; and non-significant for the hardiness composite. Lastly, Wiebe and McCallum (1986) found that hardiness (1) functioned independently of stress, (2) had direct effects on health/illness reports, and (3) had indirect effects largely through its association with more effective use and maintenance of good health practices.

Construct validity

A third issue that has received attention is the construct validity of the hardiness construct. In particular, researchers have tested for relationships between hardiness and social support, self-esteem, optimism, and various indices of maladjustment.

Hardiness and social support.

With regard to social support and hardiness, Kobasa and her colleagues found a complex relationship between the two constructs. Kobasa (1982b) reports finding no correlation between hardiness and social support as indexed by frequency of contact with others. She did, however, find that perceived support at work was associated with increased stress resistance for both high and low hardy individuals. Perceived family support, however, increased stress resistance for high hardy individuals, but decreased resistance for low hardy individuals. Kobasa attributed these differential findings to the multidimensionality of social support.

Ganellen and Blaney (1984), on the other hand, found that perceived social support from intimate and casual social contacts was significantly correlated with the commitment and challenge dimensions of hardiness ($p < .001$), but not with the control dimension (powerlessness and locus of control). These authors suggested that social support and composite hardiness appear to tap different constructs, but that certain components of hardiness may be confounded with measures of social support. They recommend, therefore, that in order to avoid a loss of information, hardiness should be measured as a multidimensional construct.

Rich, Sullivan, and Rich (1986) found low to moderate correlations between perceived social support and the components of hardiness (.03 to .35). The correlations were negative with alienation and lack of control, but positive with security.

Hardiness and self-esteem.

Referring to works by Maddi (1967, 1970) on the relationship between a lack of a sense of meaning and importance with the development of neurosis, Kobasa (1982b) has described hardiness as associated with the "ability to believe in the truth, importance, and interest value of who one is and what one is doing...." (p.6) Kobasa has noted in this conceptualization of hardiness a resemblance to the construct of self-esteem, though she also has stated that hardiness is

more than self-esteem because hardiness includes the notion of community.

To test the suggestion that hardiness is associated with self-esteem, Hull, Van Treuren, and Virnelli (1987) related hardiness and its components to a measure of self-esteem (Watkins, 1978). They found that persons who scored high on composite hardiness (low hardy), high on commitment (alienation), and high on control (powerlessness) scored low on self-esteem. The component of challenge had no association with self-esteem.

Hardiness and optimism.

Kobasa, Maddi, and Courington (1981) assert also that hardy people are characterized by their strong inclination to make optimistic cognitive appraisals. Maddi, Kobasa, and Hoover (1979) reported, in particular, that the Alienation scale (subsequently used as one of the negative indices of hardiness) was negatively associated with a measure of optimism. They did not, however, report the name of the optimism measure or the strength of the association. Rhodewalt and Agustsdottir (1984) reported that hardy people were more likely to perceive life events as positive. They reported results, however, only for composite hardiness, not for each of the three hypothesized components of hardiness. Building on attention/self-regulation theory, Scheier and Carver (1985) reported a significant negative relationship between

dispositional optimism, described as a generalized expectancy that good things will happen and indexed by the Life Orientation Test, and three of Kobasa's hardiness sub-scales: the Alienation from Self and Alienation from Work subscales of commitment and the Powerlessness subscale of control.

To further clarify the degree of association between hardiness and optimism, Hull, Van Treuren, and Virnelli (1987) compared subjects' scores on composite hardiness (measured by both the short and the long form) and on each of its three components with their scores on an index of dispositional optimism (the Life Orientation Test). They found a significant relationship between the LOT scores and scores on composite hardiness and the commitment and control components. Subjects lacking these characteristics of hardiness were more pessimistic. They found no association between the component of challenge and the measure of optimism.

Optimism may also be related to hardiness viewed as a mediator of coping styles. Just as Kobasa has claimed that hardy people are more likely to engage in transformational rather than regressive coping, several researchers have found that subjects who score higher on the Life Orientation Test are more likely to engage in problem-focused coping and less likely to engage in avoidance or disengagement (Scheier & Carver, 1987; Scheier, Weintraub, & Carver, 1986). Additionally, the studies report that optimists report fewer physical symptoms

and a greater sense of physical well-being (Reker & Wong, 1985; Scheier & Carver, 1985; Scheier, Weintraub, & Carver, 1986). Other theorists and researchers (Lazarus, Kanner, & Folkman, 1980; Seligman, 1975; and Taylor, 1983) who did not use the Life Orientation Test, have likewise asserted that being able to maintain a positive mood and optimistic outlook facilitates effective action and problem solving.

Hardiness and maladjustment.

The hardiness constellation as measured also has been compared to various operators of psychological pathology: general maladjustment, depression and depressive cognitions, neuroticism, and negative affectivity.

Funk and Houston (1987) suggested that many of the subscales used to index hardiness, in particular the alienation and powerlessness subscales, are similar to scales used to measure maladjustment. In an initial test of their suggestion, Funk and Houston found a statistically significant correlation between the five subscales most frequently used by Kobasa to index hardiness and 1) the College Maladjustment Scale (Kleinmuntz, 1961) [r (118) = -.40, $p < .001$; and 2) the General Maladjustment scale of the Tennessee Self Concept Scale (Fitts, 1964) [r (118) = .25, $p < .01$.

To further test these correlations, Funk and Houston conducted a set of both retrospective and prospective analyses making use first of analyses of variance and covariance and

then of multiple regressions of depression and physical health on hardiness, general maladjustment, stressful life events. The retrospective ANOVA replicated the findings of Kobasa for a main effect of hardiness on both physical illness ($p < .05$) and on depression ($p < .01$). No interactive (buffering) effects between stress and hardiness were found, however. In the ANCOVA designs, however, the main effect of hardiness on physical illness no longer obtained when general maladjustment served as the covariate. The main effect on depression did not remain when the College Maladjustment scores were controlled, but did remain when the General Maladjustment scores were controlled ($p < .05$). Prospective ANCOVA analysis revealed a main effect for hardiness on posttest depression (two months later) scores whether or not maladjustment scores were controlled; no main effect was found for physical illness.

None of the statistically significant effects of hardiness were replicated when retrospective regression analysis was employed. This held whether or not maladjustment was controlled. A prospective regression analysis found a main effect for hardiness on depression only ($p < .05$). This effect remained whether or not maladjustment was controlled. Finally, in order to ascertain which subscales of the hardiness measure accounted for most of the shared variance between hardiness and later depression, separate regression analyses were conducted for each of the five subscales. A significant main effect was

found for only the Alienation from Work subscale ($p < .01$).

In summary, Funk and Houston (1987) do not maintain that maladjustment should replace hardiness, but do assert that the hardiness construct has not been well operationalized by the current scales in use. They recommend that the scale be modified to make it more distinct from measures of maladjustment. They further recommend that researchers pay attention to the effects of specific subscales of hardiness, rather than simply to a composite score.

Researchers also have found a significant relationship between hardiness and depression. Ganellen and Blaney (1984) reported a significant relationship between the Alienation from Self subscale of the hardiness measure and depression as indexed by the Beck Depression Inventory. Similarly, Rhodewalt and Zone (1989) found a significant negative correlation between the hardiness subscales currently in use and depression (BDI), even when controlling for number of negative events or amount of negative adjustment required by events. Rich, Sullivan, and Rich (1986) found significant correlations between depression (BDI) and the commitment and control components (.37 to .42), but not the challenge component (.03) of hardiness. Finally, Hull, Van Treuren, and Virnelli (1987), using both the unabridged and the revised forms of the hardiness measure, found a significant correlation between composite hardiness scores and depression (BDI). Additionally,

they found that the commitment (alienation) subscales were significantly related to depression; the challenge (security) subscale was not related to depression; and the control subscales were related to depression in two of three samples.

In a related vein, Hull, Van Treuren, and Virnelli (1987) tested the correlation between hardiness (using the abridged form) and the Attitudes Toward Self Scale developed by Carver and Ganellen (1983) to index an hypothesized specific subcomponent of depression: self-punitiveness. This scale includes three sub-dimensions: self-criticism, high standards, and over-generalization of negative self-judgments. The scores on the hardiness subscales of commitment and control, and the score on composite hardiness were all found to be related to over-generalization, but not to self-criticism or high standards. Lack of commitment, control, and hardiness were related to an increased tendency to overgeneralize negative self-judgments. Challenge was unrelated to over-generalization or high standards, but a lack of challenge was related to increased self-criticism.

Other researchers have found a relationship between hardiness and neuroticism. Allred and Smith (1989), having noted that previous research had discovered that the relation between hardiness and health reports was most frequently found to be a main effect rather than a hardiness x stress interaction as implied by Kobasa's designation of hardiness as

a moderator variable, suggested that the effects attributed to hardiness may actually reflect the operation of a more fundamental individual difference dimension: neuroticism. Specifically, these researchers have suggested that the hypothesis that hardy persons respond to stress with consistently positive primary and secondary cognitions or appraisals may reflect a relative absence of neuroticism. To index "neuroticism," they employed the Trait scale of the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970) because of its apparent, close relationship to a variety of other measures of anxiety, depression, negative affectivity, and maladjustment. (They thus see their results as generally in line with those of Funk & Houston, 1987; Hull, Van Treuren, & Virnelli, 1987; and Rhodewalt & Zone, 1989, suggesting a possible confounding between hardiness and depression or negative affectivity.) Using the revised and the abridged forms of the hardiness scale, they found both to be significantly correlated with STAI trait scores: r's (84) = .53 and .48, respectively, p's < .001. Further, after classifying subjects into one of two categories (high vs. low), they found a point biserial correlation with STAI scores of .50 (df =59), p <.001. They concluded, therefore, that hardiness as presently measured is clearly confounded in this sample with neuroticism.

In a related vein, Smith, Pope, Rhodewalt, and Poulton (1989) recently have reported a confounding of the Life Orientation Test with neuroticism or negativity affectivity as indexed by two highly correlated measures of anxiety: the Taylor Manifest Anxiety Scale and the trait form of the State-Trait Anxiety Inventory (A-Trait; Spielberger, Gorsuch, & Lushene, 1970). They concluded that previously reported associations between optimism and both greater use of effective forms of coping and less reporting of symptoms actually reflect the more established personality dimension of neuroticism. They caution that the same confounding may be also operating with other correlates of optimism. Specifically, they caution that studies such as those on hardiness and health, which rely on self-reports of illness and which some researchers have reported to be confounded with measures of maladjustment (e.g., Funk & Houston, 1987), may actually be assessing the degree of correlation between neuroticism and health. Further bolstering this cautionary note, two recent studies have provided evidence that correlations between hardiness and illness reports are greatly attenuated or eliminated when indices of neuroticism or negative affectivity are controlled (Funk & Houston, 1987; Rhodewalt & Zone, 1989). A third study has broadened the scope of this problem of a confounding with neuroticism and/or negative affectivity to the entire field of health research (Watson & Pennebaker, 1989). This study focused on the

relationships of positive and negative affectivity with health complaints and stress. Results indicated that negative affectivity was highly associated with both stress and symptom reports, and not associated with actual, long-term health status. Positive affectivity, on the other hand, was not significantly related to either symptom or stress reports. To further test these relationships, the authors conducted a principal components analysis on scales measuring both positive and negative affectivity, stress, health complaints, and objective, behavioral health indices. The rotated solution indicated that negative affectivity and symptom and stress complaints formed the first component; the objective, behavioral indices formed the second; and positive affectivity formed the third component. Based on these findings, the authors conclude that much of the existing research in health psychology may have to be re-evaluated.

Finally, Rich, Sullivan, and Rich (1986) found significant correlations between loneliness and the alienation and lack of control components of hardiness (.31 to .42, $p < .001$). The correlation between loneliness and the security component (-.19) was significant at the .05 level, but in the opposite direction.

The dimensionality of hardiness

The second issue, dimensionality, concerns whether or not the three components (commitment, control, and challenge) are

all indicators of a single underlying dimension termed "hardiness." Clearly, other researchers have found beneficial effects on health/illness for each of these same or similar variables taken singly (e.g., Antonovsky, 1974, 1979; Averill, 1973; Johnson & Sarason, 1978; Lazarus, 1966; Lefcourt, 1973, 1981a, 1981b, 1985; Smith, Johnson, & Sarason, 1978). In almost all of their published studies, Kobasa and her colleagues reported on a principal components analysis showing that the three components all loaded significantly on a single dimension. A single, composite z-score was therefore used to index hardiness. Hull, Van Treuren, and Virnelli (1987) state, however, that in a personal communication with Kobasa and Maddi in 1982, data were presented from an obliquely rotated factor solution that showed the subscales of hardiness were "refined to load on only one of three uncorrelated factors (commitment, control, and challenge)." (p. 520). Following the report of this second analysis, researchers on hardiness have focused on the differential effects of each of the three components and on conducting their own factor analyses of the hardiness measures.

Exploration of the differential effects of the three components has been characterized by a diversity of findings, produced, in part, by the different indices of hardiness used. Ganellen and Blaney (1984), for example, exploring the independent effects of the components, found that commitment (alienation from self) and challenge (vegetativeness), but not

control, predicted depression in college women. Further, only alienation from self interacted significantly with life stress. These authors suggested, therefore, that important information is lost when hardiness is treated as a single score. It should be noted, however, that Ganellen and Blaney employed The Alienation Test (Maddi, Kobasa, & Hoover, 1979), and not the same five subscales generally used by Kobasa. In contrast to Ganellen and Blaney's findings, Rich and Rich (1985) and Schlosser and Sheeley (1985) found predicted (and relatively independent) effects for commitment and control, but not for challenge on burnout and on health respectively (for a summary discussion, see Hull, Van Treuren, & Virnelli, 1987). Roth, Wiebe, Fillingim, and Shay (1989) found that the commitment component accounted for most of the relationship between hardiness and health, and that challenge did not contribute at all. Singer and Rich (1985) found that only locus of control added significantly to the prediction of illness. Bruining (1986) found that composite hardiness had a significant main effect on illness, but when the six subscales were assessed in a MANOVA design, only the two subscales of control (locus of control and powerlessness) and the alienation from self subscale of commitment contributed significantly. The Alienation from Work subscale of commitment, and the two subscales of challenge produced negligible contributions.

Several research teams have carried out their own principal components or factor analyses on the items of the hardiness subscales. All employed undergraduate students as their subject pool. Funk and Houston (1987) conducted an orthogonally rotated principal components analysis on the items of the five subscales most frequently used by Kobasa to negatively index hardiness: Alienation from Self, Alienation from Work, Powerlessness, External Locus of Control, and Security Orientation. They found only two components with eigenvalues of 1.0 or larger, which, taken together, accounted for about 69% of the variance in the original correlation matrix. Additionally, they found the item loadings of the subscales on the three components of hardiness to be inconsistent with the original conceptualization of hardiness. They found that items for Alienation from Self and Alienation from Work (indices of commitment) and Powerlessness (one of two indices of control) were loaded highly by a first component (.83, .82, and .87 respectively). The Security Orientation items (an index of challenge) and the External Locus of Control items were loaded highly but in bipolar fashion by a second component (.82 and -.62 respectively). They used an orthogonal rotation because they had found in an oblique rotation that the correlation between the two components was small (r=-.04).

Hull, Van Treuren, and Virnelli (1987) conducted two principal components analyses. The first was carried out on

the six-subscale version of the unabridged hardiness measure: the five subscales used by Funk and Houston (1987), plus the Need for Cognitive Structure subscale which had been included in Kobasa's early studies as an additional index of challenge. Consonant with Kobasa's conceptualization of hardiness, they found three components, but the item loadings of the subscales on the three hardiness components were not consonant with this conceptualization. As in the analysis of Funk and Houston (1987), the items from Alienation from Self, Alienation from Work, and Powerlessness loaded consistently as marker variables (.32 to .64) on a first component (labelled commitment). The External Locus of Control items loaded weakly and negatively (-.30 to -.46) but consistently on a second component (labelled control). The Security Orientation items loaded weakly (.31 to .41) and inconsistently on components one and two. The Need for Cognitive Structure scale items loaded with some consistency on a third component (labelled challenge). Inspecting the item loadings in their analysis, Hull, Van Treuren, and Virnelli (1987) found that of the 36 items retained by Kobasa and Maddi in the revised hardiness scale, a total of 25 had loaded as predicted by Kobasa and Maddi (11 of 12 items selected for the revised form of the commitment scale loaded only on component one; 9 of 16 items selected for the revised control scale loaded only on component two; and 5 of 8 of the items selected for the revised challenge scale loaded

only on component three.) Hull, Van Treuren, and Virnelli (1987) conducted a second principal components analysis on these data and on two different samples, selecting only those items that Kobasa and Maddi had included in the revised version. For both samples, the three identifiable components were commitment, control, and challenge. These three components accounted for 26% of the variance in each of the samples. They report high product-moment correlations between the component loadings in Samples 1 and 2 (loadings on component one, $\underline{r}$ = .92; on component two, $\underline{r}$ = .88; on component three, $\underline{r}$ = .88). All of the commitment items loaded as predicted in Sample 1, and 10 of 12 loaded as predicted in Sample 2. For control, 11 of the 16 loaded as predicted in both samples. The items that did not load as predicted came from the Powerlessness and Cognitive Structure scales. Only 3 of the 8 challenge items loaded as predicted in Sample 1; and 6 of 8 in Sample 2. In a test of internal consistency, they found the following Cronbach alphas for the subscales on the two samples: commitment (12 items; alpha: .73 and .72); control (16 items; alpha: .71 and .72); challenge (8 items; alpha: .41 and .44). Item-total correlations for the scales of commitment and control were in the moderate range. The weakest item-total correlations for the control scale were associated with the Powerlessness and Cognitive Structure subscales. Item-total correlations for challenge were generally quite low. The

authors concluded from these principal components and reliability analyses that hardiness is not unidimensional, that commitment is being more precisely measured than control or challenge, and that the challenge scale is severely inadequately measured.

Rich, Sullivan, and Rich (1986) conducted a principal components analysis with varimax rotation on the five subscales of the unabridged hardiness measure, four family environment scales (family contact, family cohesion, family expression, and family conflict), campus support, depression, loneliness, and life stress. A four-component solution emerged. The four family scales emerged as marker variables (all loaded .60 or higher) for a first component that accounted for 30.4% of the total variance. This component was labelled Family Support. Four of the five hardiness subscales emerged as markers (.58 or higher loadings) for a second component, which accounted for 13.6% of the variance. The External Locus of Control scale loaded only .27. This component was labelled General Hardiness. The third component was bipolar and accounted for 9.3% of the variance. Three of the four marker variables (external locus of control, loneliness, and depression loaded negatively (-.62 to -.53 respectively); the fourth marker (campus support) loaded positively (.76). This component was labelled Perceived Social Self-Efficacy. Life stress was the only marker (.77) for a fourth component which accounted for

7.6% of the variance. Comparability of these findings with the previous principal components analyses is difficult because of the number of variables entered into the analysis.

Summary

While the hardiness construct has received a good deal of attention in the literature and has shown promise as a moderator/mediator variable in the relationship between stress and illness, critical issues have arisen that concern primarily the operationalization and measurement of the construct. These issues include: (1) the paucity of published psychometric data by Kobasa and her colleagues; (2) the multiplicity of indices used to measure hardiness; (3) the use of negative, proxy indicators and the consequent apparent confoundings with various measures of maladjustment; (4) inconsistency in findings concerning how hardiness has its effects; an inconsistency related in part to measurement issues; (5) the lack of clarity concerning the dimensionality of the construct, along with the apparently premature use of a composite index which may have caused the loss of significant information.

The current study's intent was to construct and factor analyze a new, single instrument intended to index not the degree of alienation, external locus of control, and security orientation, but, directly, the degree of commitment, control, and challenge orientation. The designs chosen for both the construction of the new measure and for the analysis of the

data were intended to address the issues of the conceptualization and dimensionality of the hardiness construct.

CHAPTER III

METHOD

Construction of the New Hardiness Measure

The first step in the construction of the new measure of personality hardiness was to descriptively define the components of the construct: commitment, control, and challenge. The definitions were intended to be faithful to the theoretically-based meanings of the three components that Kobasa elaborated in her original conceptualization of hardiness, prior to her employment of negative indices to operationalize the construct (Kobasa, 1979a, 1979b, 1982b; Kobasa, Hilker, & Maddi, 1979; Kobasa, Maddi, & Kahn, 1982).

In an attempt, however, to enhance the rational discriminability among the three components, several of the original definitional sub-domains were changed. First, Kobasa included "finding meaning in all experience" as part of the definition of commitment, and "incorporating events into an overall life plan" as part of the definition of control. In the present measure, these two descriptors were fused and made part of the definition of commitment since they both included the notion of meaning, and since the notion of meaning had been most closely associated with the commitment dimension in Kobasa's conceptualization of hardiness.

Second, Kobasa described commitment as including "decisiveness," and control as including "able and willing to make one's own decisions." For the present measure, the sub-domain of decisional capacity was restricted to the dimension of control.

Third, Kobasa referred to the abilities to cognitively transform events (also termed "cognitive control") and to respond to them with an effective, flexible coping repetoire (also termed "coping skills") as part of the control dimension; and referred to the capacities for cognitive flexibility or openness (also termed "inflexibility of cognitive categories") and tolerance for ambiguity as part of the dimension of challenge. In an attempt to reduce at least the amount of apparent terminological overlap, flexibility in cognitive and behavioral coping was made part of control, and the term "cognitive flexibility" was dropped from the challenge definition. Tolerance for ambiguity was kept as part of challenge, and "openness" was subsumed under the "seek new experiences" and "view change as an opportunity" aspects of the challenge definition.

The descriptive definitions used to develop the new measure, then, were as follows:

Commitment: A cognitive-affective and behavioral tendency to perceive self as integrated in a trustworthy world, to be engaged in meaningful and mutually

valued relationships, and to derive a sense of meaning and worth through responsible involvement with one's own self as well as with family, work, friends, and society.

Therefore, persons who are committed:

(1) are involved in (closely identified with) themselves, and their work, family, friendships, and society

(2) believe in who they are and what they are doing

(3) have a sense of purpose and direction

(4) can find meaning in all experiences

(5) have a basic trust in the world and other people.

Control: A cognitive-affective and behavioral tendency to perceive that one can influence events in one's life, and to attribute the causes and outcomes of events primarily to one's self.

Therefore, persons with internal control:

(1) believe that events can be determined, influenced, and/or directed primarily by themselves

(2) emphasize their own personal responsibility for events and interactions

(3) can make decisions autonomously in light of

their own values

(4) have a flexible coping repetoire in response to stress.

Challenge: A cognitive-affective and behavioral tendency to view change, ambiguity, and novelty as characteristic of life and growth and to actively explore the environment for supportive resources. Therefore, persons oriented to challenge:

(1) view change as an opportunity for growth rather than as a source of threat

(2) have a tolerance for ambiguity

(3) seek out new experiences

(4) know where to turn for supportive resources

(5) are willing to take responsible risks.

112 items were constructed on a rational basis to index these definitional sub-domains of the hardiness construct. The items were written in both positive and negative directions. In order to avoid confounding hardiness with maladjustment, items representing symptomatology were eliminated.

A set of the 112 items, along with the definitions of each component of hardiness, was then given to each of seven graduate students in Counseling Psychology at Loyola University. The students were asked to judge which component they believed each item would index: commitment, control, or challenge.

With few exceptions, only those items were retained that (1) received high inter-judge agreement in this back-translation process (i.e., at least 85% agreement) and that (2) were considered conceptually non-redundant. 62 items met these criteria. Seven items with 70% inter-judge agreement and one with 57% agreement were also retained in order to keep a balance in the number and keyed direction of items indexing each definitional sub-domain of each component. The same seven graduate students were then given these 70 items to solicit their comments on the wording of each item. As a result, changes were made in the wording of several items to enhance clarity and readability.

The initial measure, therefore, contained 70 conceptually non-redundant items (see Appendix A for a copy of the measure) written specifically to index commitment (24 items), control (25 items), and challenge (21 items). 36 items were positively-keyed; 34 negatively-keyed. (See Appendix B for a breakdown of items according to the component they were intended to index and their keyed direction). The negatively-keyed items were reverse scored so that increasing levels of hardiness would be reflected in higher item and total scores. Each item is rated on a four-point (1 = not characteristic; 2 = somewhat characteristic; 3 = quite characteristic; 4 = very characteristic) scale. A four-point scale without a neutral position and without extreme wording of the end-points (such as

completely or strongly characteristic) was chosen in order to increase item response-variance (Wyatt & Meyers, 1987).

The end of the initial 70-item Hardiness Scale contained additional items on respondent demographic characteristics, perceived importance of religious/spiritual values, and perceived stress (see Appendix C). The religious value item was added because Kobasa had hypothesized that people with spiritual values would have a greater sense of meaning in their lives and would be, therefore, more hardy. The stress items were included as criterion indices in initial construct validity analyses because it was hypothesized that a valid measure of hardiness should correlate negatively with perceived stress (Kobasa, 1979a, 1979b).

Subjects and Procedures

The 70-item Hardiness protocol, along with the background items and a cover letter (see Appendix D), was mailed to all adult (25 years of age and older) undergraduate students enrolled in the University College of Loyola University during the spring semester of the 1987-1988 academic year (N = 935). All protocols were coded to protect anonymity. Postcards were sent two weeks and again one month after the initial mailing to remind subjects to return their questionnaires. 308 protocols were returned by the post office as undeliverable. Of the remaining 627 subjects, 306 returned useable protocols in postage-paid envelopes, representing a return rate of 33% of

the total mailed, and 49% of those with accurate addresses.

The sample for this study (see Table 1) consisted of 110 men (36%) and 196 women (64%). The mean age was 34.3 years (sd = 8.8; range = 25-81). 43% were single, 46% married, and 11% divorced, separated, or widowed. 60% had no children. Most were Caucasian (80%), and worked full-time (81%). The median yearly household income was approximately $35,000. Though this sample represented 33% of the total number of adult students enrolled in the University College, it appeared to be representative of the total population (Gibson, Brennan, Brown, & Multon, 1989) in terms of age (M = 32.5; SD = 8.8); gender (men = 38%; women = 62%); ethnicity (72% caucasian); and marital status (65% unmarried; 33% married).

Data Analysis

Since the major questions of this investigation concerned the conceptualization and dimensionality of the hardiness construct, principal components analysis with orthogonal rotations was employed as the primary data-analytic procedure, using SPSS-X software (SPSS, Inc., Release 3.0, 1988). Eigenvalue and scree criteria, percent of variance accounted for by components, number of marker variables on each component, percent of remaining large (>.10) residuals, and interpretability of components served as the primary guides for

Table 1

Summary of Respondent Characteristics (N=306)

Variable	N	%	M	SD	Obtained Range
Age			34.3	8.8	25-81
Gender					
Male	110	36			
Female	196	64			
Marital Status					
Single	130	43			
Married	141	46			
Divorced	28	9			
Separated	4	1			
Widowed	2	1			
Missing	1	0			
Number of Children					
None	184	60			
One	53	17			
Two	40	13			
Three	19	6			
More than three	6	2			
Missing	4	1			
Ethnicity					
Asian-Pacific	6	2			
Afro-American	38	12			
Caucasian	244	80			
Hispanic	15	5			
Native American	0	0			
Other	3	1			
Hours Work Weekly					
1 - 9	10	3			
10 - 19	8	3			
20 - 29	11	4			
30 - 39	60	20			
40 or more	185	60			
Unemployed	10	3			
Homemaker	19	6			
Missing	3	1			

(table continues)

Variable	N	%	M	SD	Obtained Range	Potential Range
Annual Income						
Under 10,000.	13	4				
10,000-19,999.	25	8				
20,000-29,999.	75	25				
30,000-39,999.	61	20				
40,000-49,999.	39	13				
50,000-59,999.	25	8				
60,000-69,999.	19	6				
70,000-79,999.	15	5				
80,000 or more	32	10				
Missing	2	1				
Religious Values			5.2	1.8	1 - 7 [a]	1 - 7
Stress Perception Items						
Work Stress			4.2	1.8	1 - 7 [b]	1 - 7
Financial Stress			4.5	1.8	1 - 7	1 - 7
Family Stress			3.3	1.8	1 - 7	1 - 7
Interpersonal Stress			3.3	1.7	1 - 7	1 - 7
Social Stress			2.2	1.3	1 - 7	1 - 7
Inner Life Stress			3.8	1.7	1 - 7	1 - 7
Health Stress			2.9	1.8	1 - 7	1 - 7
Stress Composites						
Personal Stress			15.45	5.59	5 - 32	5 - 35
Work Stress			8.71	2.96	2 - 14	2 - 14
Total Stress			24.11	7.24	7 - 46	7 - 49

[a]Range: 1 = Not important, 7 = Very important.

[b]Range: 1 = Not at all stressful, 7 = Very stressful.

component extraction. (An item was considered a marker variable if its component loading was .40 or higher.)

To confirm the adequacy of the final component solution, the Salient Variable Similarity Index (S) procedure (Cattell, Balcar, Horn, & Nesselroade, 1969) was used to assess the degree of invariance (replicability) of the solution: (1) across three extraction methods (principal components, maximum likelihood, and principal axes), and (2) across two random subsamples of subjects. Stringent criteria were employed to define hyperplane categories in this procedure (i.e., -.40 to .40).

Two procedures were employed in order to further address the issue of whether the hardiness construct is best viewed as unidimensional or multidimensional: (1) inspection of the magnitude of loadings of items on the first unrotated principal component of the final solution; and (2) higher-order factor analysis (using the component-derived scale intercorrelations as the correlation matrix).

Finally, Cronbach's coefficient alpha was used to estimate the internal consistency of each of the component-derived scales (obtained by summing ratings across the marker items of each component) and Pearson product-moment correlations were employed to assess the intercorrelations among the scales. A comparison of the magnitude of the intercorrelations versus the magnitude of the reliability

estimates was used to assess the degree of unique, reliable variance contained in each scale. If the scale intercorrelations were all smaller than the scale reliability estimates, this would be evidence that the scales contained a significant amount of unique, reliable variance.

In order to gather initial validity evidence on the final scale structure solution, correlational analyses between each component-derived scale and the demographic variables, religion variable, and perceived stress variables were performed. In addition, a factor analysis was performed on the seven stress items in order to further analyze and summarize the relations between the hardiness scales and perception of stress. All correlations were corrected for attenuation.

CHAPTER IV

RESULTS

This chapter presents the results of statistical analyses performed on the data. Results of the principal components analyses are presented first, followed by data on: (a) the invariance of the final solution; (b) the utility of a hardiness composite score; (c) the internal consistency reliabilities and intercorrelations of the component-derived scales and the hardiness composite; and, (d) the construct validity of the final Hardiness Scale.

Principal Components Analyses

Before conducting the first principal components analysis, item-total score correlations and item characteristics (means, standard deviations, and ranges) of the 70-item Hardiness measure were inspected. Three items (8, 49, 61) with negative item-total correlations were eliminated as poor representations of the hardiness domain.

The principal components analysis of the remaining 67-item measure yielded 22 components with eigenvalues greater than 1.00. However, an inspection of the scree plot suggested 10 components. Since previous research has found the eigenvalue criterion to result in an over-extracted solution in principal components analysis, 10 components were extracted and rotated orthogonally with a varimax rotation procedure.

The orthogonally rotated 10-component solution revealed only six components that were clearly interpretable; and the final scree plot suggested a 6-component solution. The last four components each accounted for less than 3% of the variance, and none contained more than four marker items. Further, 10 other items did not load substantially on any component. Thus, the 16 items from the last four components and the 10 items that did not contribute to the component structure in the 10-component solution were eliminated (see Appendix E for factor loadings of 10-component solution).

The intercorrelation matrix of the remaining 41 items was then subjected to a principal components analysis. The results of this analysis, based on eigenvalue and scree criteria, however, suggested a 4-component rather than 6-component solution. A comparison of 6-component and 4-component varimax rotated solutions confirmed the superiority of the 4-component solution. The last two components of the 6-component solution contained only two marker items each, and neither was clearly interpretable. All of the components of the 4-component solution were interpretable, and each accounted for a significant amount of variance in the original correlation matrix (13.2%, 8.7%, 7.8%, and 7.0% for components 1, 2, 3, and 4, respectively). Only 29 of the 41 items, however, loaded above .40 on at least one component (see Appendices F and G for factor loadings of 6- and 4-component solutions).

Therefore, in the next principal components analysis, four components from the 29-item intercorrelation matrix were extracted and rotated orthogonally. This 29-item, 4-component, orthogonal solution was clearly an improvement over all other solutions. It accounted for more of the variance in the correlation matrix than did the 41-item solution (viz., 45.1% vs. 36.7%), and reduced the percent of large (>.10) residuals from 11.2% to 10.5%. Additionally, all 29 items had component coefficients greater than .40 on one and only one component. Cronbach's alpha was satisfactory for the first three components (.86, .75, and .75 respectively), but was weaker for the fourth component (.59). Because of the marginal internal consistency estimate for the last component, one item (#3) that had a component loading of .39 on the fourth component in the previous 41-item, 4-component solution was added for a re-rotation to a 30-item, 4-component, orthogonal solution.

This final 4-component, 30-item solution (see Table 2) resulted in the same four clearly interpretable components as in the 29-item solution. The four components accounted for 44.4% of the variance in the correlation matrix, and the added item (#3) loaded, predictably, on component four, increasing the internal consistency of this component from .59 to .64. Item #3 was, therefore, retained. All 30 items had component coefficients greater than .40 on one and only one component, indicating satisfactory convergent and discriminant validity,

Table 2

Factor Pattern Matrix for Final 4-Component Orthogonal Solution

Items	Factors I	II	III	IV	COMM	FUPC
18. I like new situations	.78	.02	.10	.09	.62	.70
50. I enjoy new roles	.77	.09	.12	.08	.62	.72
41. I like new ideas	.75	.04	.22	.12	.63	.75
70. I prefer variety	.71	.02	-.04	.05	.50	.58
17. See change as challenge	.67	.01	.25	.11	.53	.69
30. Explore alternatives	.61	.14	.16	-.15	.43	.53
42. Several ways to handle	.60	.05	.28	-.04	.45	.60
59. Like stability over change*	.59	-.27	-.05	.28	.51	.50
37. Don't like the unfamiliar *	.53	.01	.05	.36	.41	.59
32. Do best in unstructured	.50	.06	-.20	.05	.29	.35
24. See world as opportunity	.48	.14	.19	.15	.31	.55
1. Prefer settled/stable life *	.41	-.28	-.15	.34	.39	.34
19. Feel committed to family	.07	.78	.07	-.03	.62	.24
69. Get support from family	.03	.78	.04	.22	.66	.29
53. Family roots important	-.09	.72	.09	-.06	.54	.10
39. Are people I'm committed to	.07	.56	.05	.07	.33	.22
7. Don't reveal to family *	.08	.55	-.01	.22	.36	.26
60. Know where to get help	.06	.47	.18	.10	.26	.25
26. Feel committed to my career	.08	.07	.79	.09	.64	.43
15. I know what I want/goals	.24	.07	.69	.08	.54	.52
65. Work chance offer society	.09	.13	.68	-.07	.50	.35
46. Job not meaningful to me	-.01	.07	.65	.36	.56	.40
4. Individual makes difference	.20	.14	.47	.04	.28	.39
25. Someone else fouls up *	-.05	.02	-.09	.57	.34	.14
16. Have little influence *	.14	.11	.04	.56	.35	.36
36. Can't influence others *	.04	.12	.06	.56	.33	.29
33. It's chance when I succeed*	.06	.13	.11	.51	.29	.31
55. Anybody could do my job *	-.07	-.04	.43	.50	.44	.29
11. Can't change my ways *	.24	.02	.07	.48	.30	.40
3. Have control over my life	.22	.10	.20	.44	.29	.44

Note. COMM = Communality estimate. FUPC = Loading on first unrotated principal component.

*These items are reverse scored so that a high score is consistent with each scale name.

and each component had at least five marker items. Each component also accounted for a significant amount of variance in the correlation matrix (16.6%, 9.6%, 9.5%, and 8.7% respectively). The number of large (>.10) residuals remained at the same low 10.5% as in the 29-item solution. The Kaiser-Meyer-Olkin measure of sampling adequacy was a very satisfactory .83.

Invariance of the Final Solution

To test for the replicability of the final 4-component, 30-item solution, Cattel, Balcar, Horn, and Nesselroade's (1969) Salient Variable Similarity Index (S) was employed to assess the degree of invariance (similarity) of the solution across two randomly divided subgroups of the total sample, and across three extraction methods. Stringent criteria were employed in all comparisons to define hyperplane categories (-.40 to +.40). To test the invariance of the solution across groups, a principal components extraction followed by varimax rotation of the 4-component solution was performed separately on each group. The resulting component pattern matrices were then compared for degree of similarity. The results of this analysis (see Table 3) indicated that all four components were highly similar and, therefore, replicable. The S indices for the four corresponding components were: .86 for component 1; .91 for component 2; .80 for component 3; and .82 for component 4. The mean S across

comparisons was .85.

To test for degree of invariance across extraction methods, the varimax-rotated matrices resulting from three different extraction methods (principal axes, maximum likelihood, and principal components) were compared. The results of these comparisons (summarized in Table 3) indicated that all four components were clearly replicable across the three extraction methods. The mean S across all 12 extraction comparisons was .93.

Utility of a Hardiness Composite Score

In order to address the issue of the dimensionality of the "hardiness" construct further, two steps were taken: (1) an inspection of the item loadings on the first unrotated principal component of the 30-item, 4-component solution; and (2) a higher-order factor analysis of the 4-components. The inspection of item loadings (see the last column of Table 2) suggested ambiguity. The first unrotated component accounted for a large percent of the variance (20.5%) in the correlation matrix, suggesting the possibility of one higher order component. The item loadings, however, were not uniformly large, especially for the items of the component later named Family/Interpersonal. This suggested that the four components were perhaps not measuring the same construct.

Higher-order factor and principal component analyses were performed to further assess the dimensionality issue. The

Table 3

Summary of Salient Variable Similarity Index Comparing Extraction Methods

Solutions[a]	PC	ML	PAF
		Challenge	
PC		.96	.96
ML			1.00
		Family Commitment	
PC		.91	.91
ML			1.00
		Work/Self Commitment	
PC		.80	.80
ML			1.00
		Control	
PC		.73	.73
ML			1.00

Note. Criterion for defining hyperplane categories: -.40 to .40. PC = Principal Component, ML = Maximum Likelihood, PAF = Principal Axis.

[a]Mean S across all 12 extraction comparisons: .93

base for these analyses was the matrix formed by the intercorrelations of the four primary components. The results are presented in Table 4. One higher-order factor was extracted by both the principal axis and principal component methods. The fourth primary component (later named Family/Interpersonal), however, appeared to share significantly less common variance than the other three primary components and had a factor loading less than .40 according to the principal axis extraction. These results, as with those revealed in the first step, suggested some caution in interpreting the unidimensionality of the "hardiness" construct, and, therefore, care in avoiding the premature use of a single composite score for all 4 components.

Reliability and Intercorrelations of Component-Derived Scales

Four scales were created on the basis of marker item content (see Table 2), and scale scores were obtained by summing responses across the marker items of each of these component-derived scales. The four primary scales appeared to measure challenge (12 items), family-interpersonal commitment (6 items), work/self commitment (5 items), and control (7 items).

Table 5 summarizes important characteristics of the four component-derived scales. Internal consistency estimates obtained with Cronbach's alpha were acceptably large for each scale: .86 for Challenge; .75 for Family/Interpersonal

Table 4

Factor Pattern Matrix for Higher Order Orthogonal Solution

Scale	Principal Component		Principal Axes	
	Factor I	Communality	Factor I	Communality
Work/Self	.73052	.53365	.59714	.35658
Control	.72897	.53140	.59674	.35610
Challenge	.63967	.40918	.46771	.21875
Family/Inter	.54009	.29170	.35779	.12801

Commitment; .75 for Work/Self Commitment; and .64 for Control. These coefficients are presented on the diagonals of the matrix in Table 5, along with the means, standard deviations, and potential and observed ranges for each scale. The intercorrelations of the four scales were uniformly low to moderate, and, in each case, were much smaller than the scale reliability estimates, suggesting that the four scales contained a significant amount of unique variance.

On the basis of the higher-order factor analysis, it was judged that sufficient evidence existed to create a composite scale. However, since some ambiguity was found concerning the underlying dimensionality, and especially whether the Family/Interpersonal Commitment scale should be regarded as an integral part of a single higher-order dimension, two different scales were created as composite indices of "hardiness." The first scale (Hardiness Composite-A) includes the Family/Interpersonal scale. A total hardiness score on this composite scale is obtained by summing the responses to all 30 items. The second scale (Hardiness Composite-B) excludes the Family/Interpersonal scale, and a total hardiness score is obtained by summing responses to the remaining 24 items.

Table 5 summarizes important characteristics of the composite scales. The two composite scales had acceptably large Cronbach alpha coefficients: .85 in both cases. The correlations of the subscales with both composite scales were

Table 5

Summary Information on Hardiness Scales (N=306)

	Scale Intercorrelations									
Scale	CH	CF	CW	CT	H-A	H-B	*k*	M	SD	Range
CH	.86						12	34.5	6.4	14-47 (12-48)
CF	.09	.75					6	19.4	3.6	7-24 (6-24)
CW	.29 *	.26 *	.75				5	14.8	3.3	6-20 (5-20)
CT	.31 *	.23 *	.32 *	.64			7	23.4	3.0	13-28 (7-28)
H-A	.79	.52	.64	.63	.85		30	92.1	10.9	49-116 (30-120)
H-B	.87	-	.64	.63	-	.85	24	72.7	9.6	39-94 (24-96)

Note. CH = Challenge, CF = Family/Interpersonal Commitment, CW = Work/Self Commitment, CT = Control, H-A = 30-item Hardiness Composite, H-B = 24-item Hardiness Composite. *k* = number of items in scale. Diagonal entries are Cronbach alpha coefficients. Numbers in parentheses report potential ranges for the scale. Numbers not in parentheses are obtained ranges.

*p <.001, two-tailed.

uniformly rather high. For the Composite-A Scale, they were: .79 for Challenge; .64 for Work/Self Commitment; .63 for Control; and .52 for Family/Interpersonal Commitment. For the Composite-B scale (which excludes the Family scale), they were: .87 for Challenge; .64 for Work/Self Commitment; and .63 for Control. These correlation estimates seemed to reflect the same ambiguity revealed by the higher-order factor analysis. That is, the scales correlated rather highly with the composite scales, suggesting they might be indexing one underlying construct. However, the correlation of the Family scale with the Composite-A scale was considerably lower than that of the others.

Construct Validity Analyses

In order to gather initial construct validity evidence on the composite scales and the four subscales, correlational analyses between the hardiness scales and seven items indexing perception of stress were performed. Perception of stress was chosen as a possible correlate of hardiness based on studies by Kobasa (1979a, 1979b). In her background questionnaire, Kobasa included 6 items indexing perceived stress in a particular area of life (work, financial concerns, social/community involvements, interpersonal relationships, family, and personal or inner-life concerns). Subjects were asked to rate on a scale of one to seven how stressful they usually thought each area of life was for them. Kobasa found that the item indexing

degree of personal (inner-life) stress was one of the best discriminators between high stress/high illness (non-hardy) and high stress/low illness (hardy) groups. Subjects in the low illness group tended to perceive less stress. In the present investigation, the same six stress items were included in the background questionnaire, with the addition of a seventh item to index perceived stress in the area of physical health. As in the Kobasa studies, a seven-point rating scale was used to index each area of potential stress. The results of the correlational analyses between the hardiness scales and perceived stress items are presented as part of Table 6.

As expected from Kobasa's findings, analyses in this study between the seven perceived stress items and the hardiness scales revealed many highly significant correlations. All of the correlations were negative, indicating that higher scores on the various hardiness scales were associated with lower scores on the perceived stress items. There were several sets of exceptions. First, no significant correlations were found between the Challenge subscale and any of the perceived stress items. Second, the Hardiness Composite-B Scale was not significantly ($p < .01$) correlated with the family, interpersonal, or physical health stress items. Third, the Work/Self Commitment subscale was not significantly ($p < .01$) correlated with the family, social, or physical health items. Fourth, the Control Scale was not

Table 6

Correlations between Hardiness Scales and Criterion Indices

	Hardiness Scales					
	H-A	H-B	CH	CF	CW	CT
Criterion Indices						
Age	-.07	-.06	-.05	-.06	.04	-.13
Gender	.01	-.03	-.04	.10	.03	-.04
Ethnicity	.03	-.01	-.03	.13	.12	-.08
Marital Status	.08	.04	.01	.14	.08	.01
Income	.17 *	.14	.04	.14	.17 *	.17 *
No. Children	.10	.06	.08	.13	.08	-.07
Hours Employed	.03	.02	.00	.03	.02	.06
Religious Values	.00	-.06	-.10	.17 *	.11	-.11
Stress Perception:						
Family	-.22 **	-.12	-.05	-.35 **	-.05	-.22 **
Interpersonal	-.21 **	-.13	-.02	-.28 **	-.20 **	-.16 *
Social/Community	-.19 *	-.16 *	-.11	-.15	-.07	-.20 *
Personal/Inner	-.22 **	-.17 *	-.10	-.22 **	-.15 *	-.18 *
Physical Health	-.19 *	-.13	-.01	-.21 **	-.13	-.25 **
Work	-.19 *	-.18 *	-.08	-.10	-.27 **	-.11
Financial	-.20 **	-.17 *	-.04	-.17 *	-.17 *	-.27 **
Stress Composites:						
Personal	-.31 **	-.22 **	-.09	-.37 **	-.19 *	-.30 **
	(-.41)	(-.29)		(-.52)	(-.26)	(-.46)
Professional	-.24 **	-.22 **	-.08	-.17 *	-.27 **	-.23 **
	(-.37)	(-.33)		(-.27)	(-.45)	(-.42)
Total	-.34 **	-.26 **	-.10	-.35 **	-.26 **	-.33 **
	(-.44)	(-.34)		(-.49)	(-.36)	(-.50)

Note. H-A = 30-item Hardiness composite, H-B = 24-item Hardiness composite, CH = Challenge, CF = Family Commitment, CW = Work Commitment, CT = Control. Numbers in parentheses report correlations corrected for attenuation. The Personal Stress composite includes the family, interpersonal, social, personal, and health items. The Professional Stress composite includes the work and financial items.

*p <.01, two-tailed. **p <.001, two-tailed.

significantly correlated with the work stress item; and the Family/Interpersonal subscale was not significantly correlated with the work or the social stress items.

As a means of further analyzing the stress items and summarizing the relationships between the stress items and the hardiness scales, a principal components analysis with a varimax rotation was performed on the seven stress items. The results of this analysis are summarized in Table 7. The analysis revealed two components. The first component (named Personal Stress) was composed of five of the stress items: personal, interpersonal, family, physical health, and social stress. All five had component loadings larger than .40 on this first component. The second component (named Professional Stress) was clearly composed of the work and financial stress items. The Personal Stress component (five items) had a mean of 15.5, a standard deviation of 5.6, and an obtained range of 5-32. The Professional Stress component (two items) had a mean of 8.7, standard deviation of 3.0, and obtained range of 2-14.

Both stress components were significantly and negatively correlated ($p < .01$) with all of the hardiness scales except Challenge, which was minimally correlated with the stress components. When the correlations between the stress components and all of the hardiness scales except Challenge were corrected for attenuation due to scale unreliability (see Table 6), the degree of their association was shown

Table 7

Factor Pattern Matrix for 2-Component Orthogonal Solution on Stress Scale

Area of Stress	Factor I	Factor II	FUPC
Personal/Inner Life	.77	.17	.76
Interpersonal	.76	.00	.66
Family	.65	.28	.70
Physical Health	.56	.27	.62
Social/Community	.42	-.01	.36
Work	-.04	.83	.38
Financial	.33	.74	.65

Note. Factor I was named Personal Stress; Factor II was named Professional Stress.

to be even larger. Further, when the sample was divided into upper and lower thirds on the basis of scores on both stress components, t-tests showed a significant ($p < .001$) difference between mean scores on all of the hardiness scales except Challenge. Those who scored higher on the stress components, tended to score lower on the hardiness scales (results of these analyses are presented in Table 8).

As a means of providing a single summary correlation between stress and each of the hardiness scales, a total stress score was obtained by summing ratings over all seven stress items. The correlations between total stress and each of the hardiness scales are listed in Table 6. When the sample was divided into upper and lower thirds on the basis of total stress scores, t-tests showed a significant ($p < .001$) difference between mean scores on all of the hardiness scales except Challenge. Those who scored higher on total stress, tended to score lower on the hardiness scales (results of the t-tests are presented in Table 9).

In order to assess the hypothesis of a significant positive correlation between hardiness and religious belief, one item was included in the background questionnaire that asked respondents to rate on a scale of 1 (not important) to 7 (very important) how important religious and/or spiritual values were to them. The resulting correlations are presented in Table 6. The religious item was found to correlate

Table 8

Group Mean Differences as a Function of Component Stress Scores

	Personal Stress					Professional Stress				
	High Stress (n=122)		Low Stress (n=106)			High Stress (n=123)		Low Stress (n=104)		
	M	SD	M	SD	t	M	SD	M	SD	t
CH	34.3	6.6	35.4	6.2	1.36	33.7	6.4	35.2	5.6	1.81
CF	18.2	4.0	20.6	2.9	5.22**	18.8	3.8	20.1	3.1	2.93*
CW	14.1	3.7	15.7	2.9	3.75**	13.8	3.4	15.8	2.9	4.79**
CT	22.4	3.4	24.3	2.9	4.93**	22.9	3.2	24.1	2.7	3.04*
H-A	89.0	12.3	96.1	8.6	5.10**	89.1	11.6	95.2	9.1	4.40**
H-B	70.8	10.6	75.4	8.0	3.79**	70.4	10.2	75.1	7.7	3.93**

Note. Stress scores were categorized into upper and lower thirds. CH = Challenge, CF = Family/Interpersonal Commitment, CW = Work/Self Commitment, CT = Control, H-A = 30-item Hardiness Composite, H-B = 24 -item Hardiness Composite.

*p <.01, two-tailed. **p <.001, two-tailed.

Table 9

Group Mean Differences as a Function of Total Stress Score

	High Stress (upper 1/3; n=105)		Low Stress (lower 1/3; n=101)		
Scale	M	SD	M	SD	*t*
Challenge	34.0	6.7	35.3	6.3	1.51
Family Commitment	17.8	3.9	20.4	3.1	5.19 *
Work Commitment	13.9	3.4	15.9	2.7	4.65 *
Control	22.3	3.4	24.5	2.1	5.59 *
Hardy Composite-A	88.0	12.4	96.1	8.9	5.41 *
Hardy Composite-B	70.2	10.8	75.8	8.0	4.22 *

*p <.001, two-tailed.

significantly (p =.002) only with the Family/Interpersonal scale. The correlation was positive, indicating that higher scores on religious belief were associated with higher scores on the Family-Interpersonal commitment scale.

Correlations obtained among the hardiness scales and demographic variables were generally very low (see Table 6). Income, however, did correlate significantly (p <.01) and positively with the Hardy Composite-A, the Work/Self Commitment, and the Control scales; and positively (p = .013) with the Hardy Composite-B and the Family/Interpersonal Commitment scale. There were no significant correlations with the Challenge Scale. One other correlation came close to the .01 significance level: a positive one (p = .014) between the Family/Interpersonal Commitment Scale and marital status, such that married respondents (M = 20.3) tended to score higher than unmarried respondents (M = 18.6) on the Family/Interpersonal Scale [t (303) = 4.15, p <.001]. There were no significant (p <.01) correlations between the hardiness scales and any of the other demographic variables: age, gender, ethnicity, number of children, and number of hours employed.

CHAPTER V

SUMMARY AND DISCUSSION

Research to date on the construct of personality hardiness has provided evidence that hardiness is not only a significant retrospective discriminator of subgroup variations in response to stress, but also a significant predictor of future health (Kobasa, 1979a, 1979b; Kobasa, Maddi, & Courington, 1981; Kobasa, Maddi, & Kahn, 1982; Schmied & Lawler, 1986; Wiebe & McCallum, 1986). While this research has shown promising findings, a review of the literature highlighted serious issues concerning the measurement and the dimensionality of the hardiness construct. The measurement issues primarily involved the use of multiple proxy measures to serve as negative indicators of the hypothesized components of the hardiness construct: commitment, control, and challenge. The use of negative indicators presumed that hardiness could be adequately operationalized as the direct converse of alienation, external locus of control, and security orientation, and exposed the hardiness construct to the charge of irrelevance since it could be argued, more simply, that alienated persons are more likely to fall ill following the experience of life stress.

The dimensionality issue involved whether the three

components of hardiness represented three highly correlated components that together served as an index of a unidimensional construct, or whether the components represented three relatively independent factors, whose separate and possibly interactive effects should be explored, and for which a single composite score would not be appropriate.

The purpose of the present study was to construct a single, direct measure of hardiness as the construct was originally conceptualized by Kobasa, and to empirically assess its dimensionality, internal reliability, and criterion-related validity. This new measure was intended to serve as an index not of alienation, external locus of control, and security orientation, but, directly, of commitment, control, and challenge orientation.

Answers to Research Questions

(1) Is there empirical support for the three components that Kobasa theorized to compose the hardiness constellation?

The principal components analysis produced four relatively independent components that appeared to be methodologically substantial and conceptually meaningful. Each of these four components: (1) was clearly interpretable; (2) consisted of at least five marker items that loaded unequivocally (>.40) on that component; (3) yielded an acceptably large Cronbach alpha estimate of internal consistency reliability; and (4) was associated with a rotated

eigenvalue exceeding 2.50. The reliability estimates for each component-derived scale were substantially larger than the scale intercorrelations, and, with two exceptions, there was a difference of at least .17 between each item's first and second highest component loadings. Each scale, therefore, appeared to be associated with an amount of unique variance sufficient to suggest that it represented a legitimate subdimension of the hardiness construct.

This four-component solution was also found to be highly invariant in comparisons of item loadings across two random subsamples of respondents, and across three extraction methods (principal components, maximum likelihood, and principal axis). The median S of the comparisons of each of the four components across the two subsamples was .85. The median S across the 12 extraction comparisons was .93. On the basis of marker item content, the four components appeared to measure: Challenge, Family/Interpersonal Commitment, Work/Self Commitment, and Control. These four components did reflect the three constructs originally conceptualized by Kobasa as constitutive of the hardiness construct, with the exception that commitment was found to be bidimensional.

In terms of content, the items of the new Challenge Scale clearly reflected the original conceptualization of challenge, but also included one aspect of the original control definition. Ten of the twelve items reflected three subdomains

of the original definition of challenge: (1) a tendency to seek new experiences (5 items), (2) a tendency to view change as an opportunity for growth rather than as a threat (4 items), and (3) a tolerance for ambiguity (1 item). The remaining two items reflected the "cognitive/behavioral coping flexibility" subdomain of the original definition of control. (The two items were: "I can usually think of several ways to handle problem situations," and "I make it a point to explore alternative ways of handling difficult situations.") These same two items, however, also could be interpreted as indices of degree of "need for cognitive structure" (cognitive flexibility and tolerance for ambiguity), which Kobasa originally theorized to be part of the challenge dimension. Clearly, there was a conceptual overlap between the flexible coping dimension of control and the cognitive flexibility dimension of challenge.

The seven items of the Control Scale reflected the original conceptualization of the control dimension. Four items seemed to index the original definitional subdomain of belief that events can be determined, influenced, and/or directed primarily by oneself; and two items seemed to index the subdomain of taking personal responsibility for events. The seventh item ("Anybody could do my job") was one of the two items of the final 30 that had relatively poor divergent validity. It had a component loading of .50 on the Control

Scale, indicating satisfactory convergent validity. It also, however, had a loading of .43 on Work/Self Commitment, the dimension it was originally theorized to index.

The construct of commitment in the new measure of hardiness was bidimensional. Items indexing commitment in the areas of work and self loaded on one component, and items indexing commitment to family and friends loaded on another. The two components were only moderately correlated (r = .26). The items of both components primarily reflected the original definitional subdomains of personal involvement and sense of purpose or direction. One item of the Family/Interpersonal Commitment Scale (When I need help or support, I know where and to whom to go") was originally theorized to index a subdomain of the challenge dimension. Four items that were originally intended to index the fifth area of commitment (society/institution) were eliminated through the course of the component analysis. In the 4-component, 41-item solution, three of these four items loaded about equally on both the Family/Interpersonal Commitment component and the Self/Work Commitment component. As a result, they did not load sufficiently (<.40) on any one component to serve as marker items.

(2) Is there evidence for a single dimension underlying the data that corresponds to general personality hardiness as defined by Kobasa?

The evidence for a single general hardiness dimension being associated with the new measure of hardiness is not strong. Neither the final 30-item, 4-component solution nor a higher-order factor analysis provided unambiguous evidence for a single hardiness dimension. In the final principal components solution, several criteria for a general component were at least partially satisfied: (1) the interitem correlation matrix exhibited very few significant negative correlations; (2) all items loaded positively on the first unrotated component; and (3) the first unrotated component had a substantially greater eigenvalue than the eigenvalue of the next largest component. However, inspection of the item loadings on the first unrotated principal component revealed that while they were all positive, they varied widely, with nine of the thirty items loading less than .30, and two loading less than .20. Moreover, while the eigenvalue of the first unrotated component was large (6.14), accounting for 20.5% of the variance in the original correlation matrix, the eigenvalues of the other three components were far from trivial (3.17, 2.08, 1.92). These latter three components accounted respectively for 10.6%, 6.9%, and 6.4% of the variance. A significant amount of variance, therefore, would be unaccounted for by a general component.

In order to test for the possibility of a hierarchical model, higher order principal axis and principal component

analyses were performed using the first-order component intercorrelation matrix as the input. Both of these analyses yielded one higher-order unrotated factor ("general hardiness"). This higher-order factor accounted for 44.4% of the total variance of the intercomponent matrix in the principal components analysis and 26.5% in the principal axis analysis. All four first-order components showed positive loadings greater than .40 on this higher order unrotated component in the principal components analysis. In the principal axis analysis, however, three components loaded above .40, but the Family/Interpersonal Commitment Scale loaded at .36. The Family/Interpersonal Commitment Scale also contained considerably less common variance than the other three scales (.29 in the principal components analysis, and .13 in the principal axis analysis). Moreover, all six items of this scale had uniformly rather low loadings on the first unrotated principal component of the final 4-component solution (the loadings ranged from .10 to .29, with an average loading of .23). While the evidence, therefore, seemed clear for a four-component first-order structure, similarly clear evidence for a higher-order unidimensional model of the hardiness construct was not apparent.

In light of this ambiguity concerning the higher-order structure of the hardiness construct, the safest interpretation seemed to be that hypotheses of one or of two higher-order

factors underlying the four primary components could be neither ruled in nor ruled out as reasonable empirical descriptions of the hardiness construct at this point in the research. Therefore, two different composite scales were created to serve as indices of the higher order structure of hardiness: Hardiness Composite-A (H-A) and Hardiness Composite-B (H-B). Since both composite scales had satisfactory internal consistency as estimated by Cronbach's alpha (.85 for both), a general hardiness score on the first composite scale (H-A) was computed by summing scores across the 30 items of all four scales, and a general hardiness score on the second composite scale (H-B) was computed by summing scores across each scale except the Family/Interpersonal scale. These two composite scales were created to avoid the loss of significant information and to better evaluate the higher order structure of the hardiness construct in future confirmatory factor analytic and cross-validation studies. They were not intended to function as substitutes for continued investigation of the independent and/or interactive effects of the four primary component-derived scales.

(3) Can sufficient reliability and validity be attained by use of a simple summated ratings procedure to estimate scale scores?

First, evidence noted earlier for the convergent validity (satisfactory internal reliability and at least five marker

items that loaded higher than .40) and divergent validity (reliability estimates substantially greater than scale intercorrelations) of the items of each of the four primary scales appeared to provide sufficient empirical support for the use of a single, summated score as an index of each of the four relatively independent scales in studies of group comparisons.

Second, the results of the higher-order analysis and the satisfactory internal consistency estimates for the two composite scales appeared to provide sufficient empirical support for the use of a single summated score to index each composite scale in studies of group comparisons.

Other Findings

Psychometric properties of the Challenge Scale.

In terms of its psychometric properties, the present Challenge Scale differed radically from the challenge scale as operationalized by Kobasa. Although some psychometric data has been reported by Kobasa and her colleagues on the proxy scales that were selected for inclusion in her hardiness scale (e.g., the subscales from the Alienation Test), almost no psychometric data has been made available on the composite hardiness scale itself or on its subscales of commitment, control, and challenge. As discussed in Chapter Two, however, an assessment of the component structure and psychometric properties of the long and short versions of the hardiness scale and its subscales was conducted by Hull, Van Treuren, and Virnelli

(1987). In their principal component analyses, challenge was the third extracted component in both the long and short versions. In their analysis of the long version, the Security scale items (ultimately used as the single index of challenge) did not load consistently on any single component. Similarly, in their analysis of the short version, the Security scale items did not load consistently on the predicted challenge dimension, and, in addition, were associated with low item-total correlations and low internal consistency coefficients. The overall alpha for the challenge scale of the short version was .41 in Sample A, and .44 in Sample B.. The correlations of the challenge subscale with the composite scale in Samples A and B were .46 and .41 respectively. Similar estimates of internal consistency for the challenge scale of the long version could not be performed since the calculations would have involved additively combining z-scores from the summed, proxy scales, and therefore been a step removed from a combination of the original items. This assessment of the challenge scale clearly raised serious doubts about its psychometric adequacy, and also, therefore, about whether it ought to be included in the hardiness construct, and whether the lack of observed effects of challenge on various criterion variables might be due to the scale's psychometric inadequacy (e.g., Hull, Van Treuren, & Virnelli, 1987).

The Challenge Scale in the present study, by contrast,

was consistently the first extracted component, accounting by far for the greatest amount of variance in the correlation matrix. The scale was composed of 12 items that loaded above .40, and its item-loading structure was highly invariant across two random subsamples and three extraction methods. The internal consistency coefficient was very satisfactory (alpha = .86), and each of the scale's items had a correlation of at least .38 with the total 30-item scale. Based on these satisfactory psychometric properties, the new Challenge Scale appears to represent a legitimate measure of the challenge construct.

Construct Validity: Absence of Challenge Correlates.

The only significant correlations found between the hardiness scales and demographic variables were between: (1) income level and all of the hardiness scales except the Challenge Scale, and (2) marital status and the Family/Interpersonal Commitment Scale. This general lack of significant correlations between the hardiness scales and demographic variables was not surprising and was similar to the findings of Kobasa and her colleagues (Kobasa, 1979b; Kobasa, Maddi, & Kahn, 1982; Kobasa & Puccetti, 1983).

The significant negative correlations found between the hardiness scales and perception of stress likewise were not surprising given Kobasa's finding that one of the perception of stress items (personal stress) functioned as a significant

discriminator between high stress/low illness and high stress/high illness groups (Kobasa, 1979a). What was surprising, however, was the absence of any significant correlation ($p < .01$) between Challenge and any of the background variables, including the perception of stress items.

Previous research, indeed, had found conflicting results about the effects of the challenge (security) scale on stress and illness (e.g., Bruining, 1986; Singer & Rich, 1985; Roth, Wiebe, Fillingim, & Shay, 1989). These conflicting results generally were understood as due to the psychometric inadequacy of the challenge subscale (e.g., Hull, Van Treuren, & Virnelli, 1987). The Challenge Scale in the present study, however, appears to be measured adequately, and still no significant correlations were found. Though it is clearly premature at this time to form any conclusions, one tentative hypothesis for the low correlations, especially with the stress items, is that the Challenge Scale is measuring something other than hardiness; perhaps, for example, optimism, or positive affectivity. Another hypothesis, in line with those previous researchers who found primarily indirect effects for the hardiness composite on stress and illness, is that a strong challenge orientation is not associated directly with a reduction in perceived stress, but (1) might act independently of stress to maintain beneficial health practices, such as exercise, diet, hygiene, lack of substance abuse (Wiebe &

McCallum,1986); or (2) might be associated with a more positive attributional style (Hull, Van Treuren, & Propsom, 1988) or more positive cognitive style (Allred & Smith, 1989); or (4) might be associated with greater psychological adjustment (Rhodewalt & Zone, 1989).

Bidimensionality of the Commitment Construct: An Hypothesis.

As noted earlier, the commitment construct was bidimensional. Items indexing commitment in the area of work and self represented one dimension, and items indexing commitment to family and friends represented another. Also as noted earlier, the higher-order structure of the hardiness construct was ambiguous. This ambiguity resulted from the equivocal loading of the Family/Interpersonal Commitment component. One hypothesis for this equivocal loading may be that the Family/Interpersonal Commitment Scale is measuring both commitment and social support. This hypothesis is based on an inspection of the item content of the scale. Two of the six items explicitly refer to support: "When I need help or support, I know where and to whom to go"; and "I get a lot of emotional support from my family." In addition, it may be that all of the items of this scale at least implicitly suggest the notion of being involved with a group that is more or less supportive. This hypothesis remains to be tested.

Limitations of the Present Study and Suggestions for Further Research

The findings of the present study are based on an exploratory principal components analysis of the new measure of hardiness, and represent initial assessments of the new measure's dimensionality, reliability, and validity. These initial assessments must be explored further in future research.

With respect to the assessment of dimensionality, future research must obtain data from independent cross-validation tests and subject this data to confirmatory factor analysis procedures, using LISREL software for testing linear structural equation models by the method of maximum likelihood (Jöreskog & Sörbom, 1986). Such procedures will assess how well the present study's derived component model accounts for the data from the cross-validation samples. If it accounts well, there will be further evidence of the present model's structural invariance and justification for the use of a standard set of scoring rules in future studies.

With respect to reliability, all of the component-derived scales had very satisfactory internal consistency reliability except for the Control Scale (.64). A larger pool of items should be created in an attempt to improve the internal consistency of the Control Scale. In addition, cross-validation studies administered at different times would

provide stability coefficients for the four primary and two composite scales.

With respect to validity, little has been done in the present study to test for correlates of the constructs of the new measure. What is being measured by this new "hardiness" measure remains an empirical question. The new measure's construct validity (nomological span), therefore, must be tested. Such validity tests will help identify the mechanisms that produce the scale scores, and relate these mechanisms to the constructs that this new measure is purportedly indexing. Included in the construct validity tests should be an assessment of whether and to what degree the scales of the new hardiness measure correlate with those constructs that previous research has explored and/or identified as correlates of one or another of Kobasa's hardiness scales, such as: self-esteem, social support, optimism, better health practices, fewer negative self-statements, less use of regressive coping, less depression, and less Type-A behavior.

Previous research also has indicated that hardy persons should experience and/or report fewer psychiatric and physical symptoms, and experience or perceive less stress. Future validity studies, therefore, also should test for the effects of the scales of the new measure on symptoms and stress.

In light of indications in the literature (referred to in Chapter Two) concerning the frequent association between self-

report health and stress measures and measures of positive and negative affectivity, the validity studies on this new measure should also test for correlations between self-report criterion variables and indices of positive and negative affectivity in order to avoid overestimation of health effects.

All validity studies also should test for interactive and independent effects of the component scales, as well as for effects of the composite scales.

Since the Family/Interpersonal Commitment Scale appeared to contain both commitment and social support items, additional evidence is needed on what is being measured by this scale. Validity tests, therefore, should include independent criterion measures of family support and family commitment. If the scale is a measure of family commitment, it should be more highly correlated with the independent measure of family commitment than with the measure of family support. If, on the other hand, the scale is primarily a measure of family support, it should be more highly correlated with the independent measure of support.

Given the limitations and the need for further research, it appears that the present study has resulted in a new measure of hardiness that directly, not negatively, reflects the theory-derived definitional subdomains of hardiness suggested in prior research: commitment, control, and challenge. The principal components analysis of this measure appears to have

revealed a dimensional structure that is relatively parsimonious and invariant. In summary, this current study has made a beginning in addressing many of the measurement issues raised in the literature concerning previous research on the construct of personality hardiness. The addressing of these measurement issues appeared to be the most pressing need from the point of view of continued programmatic research on the construct of personality hardiness.

REFERENCES

Ader, R. (Ed.). (1981). Psychoneuroimmunology. Orlando, FL: Academic Press.

Aldwin, C. M., & Revenson, T. A. (1987). Does coping help? A reexamination of the relation between coping and mental health. Journal of Personal and Social Psychology, 53, 337-348.

Allport, G. W. (1955). Becoming: Basic considerations for a psychology of personality. New Haven, CT: Yale University Press.

Allred, K. D., & Smith, T. W. (1989). The hardy personality: Cognitive and physiological responses to evaluative threat. Journal of Personality and Social Psychology, 56, 257-266.

Andrews, G., Tennant, C., Hewson, D. M., & Vaillant, G. E. (1978). Life event stress, social support, coping style, and risk of psychological impairment. Journal of Nervous and Mental Disease, 166, 307-316.

Aneshensel, C. S., & Frerichs, R. R. (1982). Stress, support, and depression: A longitudinal causal model. Journal of Community Psychology, 10, 363-376.

Antonovsky, A. (1974). Conceptual and methodological problems in the study of resistance resources and stressful life events. In B.S. Dohrenwend & B. P. Dohrenwend (Eds.), Stressful life events: Their nature and effects (pp. 245-258). New York: Wiley-Interscience.

Antonovsky, A. (1979). Health, stress, and coping. San Francisco: Jossey-Bass.

Antonovsky, A. (1987). Unraveling the mystery of health: How people manage stress and stay well. San Francisco: Jossey-Bass.

Averill, J. R. (1973). Personal control over aversive stimuli and its relationship to stress. Psychological Bulletin, 80, 286-303.

Bandura, A. (1977a). Social Learning Theory. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1977b). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.

Bandura, A. (1978). The self system in reciprocal determinism. American Psychologist, 33, 344-358.

Bandura, A. (1982). Self-efficacy mechanism in human agency. American Psychologist, 37, 122-147.

Banks, J. K., & Gannon, L. R. (1988). The influence of hardiness on the relationship between stressors and psychosomatic symptomatology. American Journal of Community Psychology, 16, 25-37.

Barrera, M., Jr. (1986). Distinctions between social support concepts, measures, and models. American Journal of Community Psychology, 14, 413-445.

Barrera, M., Jr. (1988). Models of social support and life stress: Beyond the buffering hypothesis. In L. H. Cohen (Ed.), Life events and psychological functioning: Theoretical and methodological issues (pp. 211-236). Newbury Park: Sage.

Beck, A. T. (1967). Depression: Clinical, experiments, and theoretical aspects. New York: Harper & Row.

Belle, D. (1982). The stress of caring: Women as providers of social support. In L. Goldberger & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects (pp. 496-505). New York: Free Press.

Berman, W. H., & Turk, D. C. (1981). Adaptation to divorce: Problems and coping strategies. Journal of Marriage and the Family, 43, 179-189.

Billings, A. G., & Moos, R. H. (1981). The role of coping responses and social resources in attenuating the stress of life events. Journal of Behavioral Medicine, 4, 139-157.

Billings, A. C., & Moos, R. H. (1982). Stressful life events and symptoms: A longitudinal model. Health Psychology, 1, 99-117.

Birley, J. L. T., & Brown, G. W. (1970). Crises and life changes preceding the onset or relapse of acute schizophrenia: Clinical aspects. British Journal of Psychiatry, 116, 327-333.

Brehm, J. W. (1966). A theory of psychological reactance. New York: Academic Press.

Brenner, M. H. (1973). Mental illness and the economy. Cambridge, MA: Harvard University Press.

Brown, S. D., Alpert, D., and Lent, R. W. (1988). Perceived social support among college students: Factor structure of the Social Support Inventory. Journal of Counseling Psychology, 35, 472-478.

Brown, S. D., Brady, T., Wolfert, J., Lent, R. W., & Hall, S. (1987). Perceived social support among college students: Three studies of the psychometric characteristics and counseling uses of the Social Support Inventory. Journal of Counseling Psychology, 34, 337-354.

Brown, G. W., & Harris, T. O. (1978). Social origins of depression: A study of psychiatric disorder in women. New York: Free Press.

Brown, G. W., & Harris, T. O. (1984). Establishing causal links: The Bedford College studies of depression. Unpublished manuscript.

Brown, G. W., Harris, T., & Petro, J. (1973). Life events and psychiatric disorders, Part 2: Nature of causal link. Psychological Medicine, 3, 159-176.

Bruining, D. J. (1986). Recent life events and subsequent reports of illness in an undergraduate population: An examination of hardiness. Unpublished master's thesis, Loyola University, Chicago.

Burgess, A. W., & Holmstrom, L. L. (1974). Rape: Victims of Crisis. Bowie, MD: Brady.

Burgess, A. W., & Holmstrom, L. L. (1979). Rape: Crisis and Recovery. Bowie, MD: Brady.

Caldwell, R. A., Pearson, J. L., & Chin, R. J. (1987). Stress-moderating effects: Social support in the context of gender and locus of control. Personality and Social Psychology Bulletin, 13, 5-17.

Cannon, W.B. (1932). The wisdom of the body. New York: Norton.

Carver, C. S., & Ganellen, R. J. (1983). Depression and components of self-punitiveness: High standards, self-criticism, and overgeneralization. Journal of Abnormal Psychology, 92, 330-337.

Casey, R. L., Thoreson, A. R., & Smith, F. J. (1970). The use of the schedule of recent experience questionnaire in an institutional health care setting. Journal of Psychosomatic Research, 14, 149-154.

Cassel, J. (1974). Psychosocial processes and "stress": Theoretical formulations. International Journal of Health Services, 4, 471-482.

Cassel, J. (1976). The contribution of the social environment to host resistance. American Journal of Epidemiology, 104, 107-123.

Cattel, R., Balcar, K. R., Horn, J. L., & Nesselroade, J. R. (1969). Factor matching procedures: An improvement of the S Index with tables. Educational and Psychological Measurement, 29, 781-792.

Chiriboga, D. A. (1977). Life event weighting systems: A comparative analysis. Journal of Psychosomatic Research, 21, 415-422.

Coates, D., Moyer, S., & Wellman, B. (1969). Yorklea study: Symptoms, problems and life events. Canadian Journal of Public Health, 69, 471-481.

Cobb, J. (1976). Social support as a moderator of life stress. Psychosomatic Medicine, 38, 300-314.

Cohen, L. H. (Ed.). (1988). Life events and psychological functioning: Theoretical and methodological issues. Newbury Park, CA: Sage Publications.

Cohen, F., & Lazarus, R. S. (1979). Coping with the stresses of illness. In G. C. Stone, F. Cohen, & N. E. Adler (Eds.), Health Psychology (pp. 217-254). San Francisco: Jossey-Bass.

Cohen, F., & McKay, G. (1984). Social support, stress and the buffering hypothesis: A theoretical analysis. In A. Baum, S. E. Taylor, & J. E. Singer (Eds.), Handbook of psychology and health (Vol. 4, pp. 253-267). Hillsdale, NJ: Erlbaum.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. Psychological Bulletin, 98, 310-357.

Cooley, E. J., & Keesey, J. C. (1981). Moderator variables in life stress and illness relationship. Journal of Human Stress, 7, 35-40.

Crago, M. A. (1972). Psychopathology in married couples. Psychological Bulletin, 77, 114-128.

Cronkite, R. C., & Moos, R. H. (1984). The role of predisposing and moderating factors in the stress-illness relationship. Journal of Health and Social Behavior, 25, 372-393.

Croog, S. H., & Fitzgerald, E. F. (1978). Subjective stress and serious illness of a spouse: Wives of heart patients. Journal of Health and Social Behavior, 19, 166-178.

Cutrona, C. E. (1986). Objective determinants of perceived social support. Journal of Personality and Social Psychology, 50, 349-355.

Davis, M. H., & Oathout, H. A. (1987). Maintenance of satisfaction in romantic relationships: Empathy and relational competence. Journal of Personality and Social Psychology, 53, 397-410.

Dawis, R. V., & Lofquist, L. H. (1984). A psychological theory of work adjustment. Minneapolis: University of Minnesota Press.

Dean, A., & Lin, N. (1977). The stress buffering role of social support: Problems and prospects for future investigation. Journal of Nervous and Mental Disease, 165, 403-417.

Dekker, D. L., & Webb, J. T. (1974). Relationships of the Social Readjustment Rating Scale to psychiatric patient status, anxiety and social desirability. Journal of Psychosomatic Research, 18, 125-130.

DeLongis, A., Folkman, S., & Lazarus, R. S. (1988). The impact of daily stress on health and mood: Psychological and social resources as mediators. Journal of Personality and Social Psychology, 54, 486-495.

Depue, R. A., Monroe, S. M., & Shackman, R. (1979). The psychobiology of the depressive disorders: Implications for the effects of stress. New York: Academic Press.

Dohrenwend, B. S. (1973a). Life events as stressors: A methodological inquiry. Journal of Health and Social Behavior, 14, 167-175.

Dohrenwend, B. S. (1973b). Social status and stressful life events. Journal of Personality and Social Psychology, 28, 225-235.

Dohrenwend, B. S., & Dohrenwend, B. P. (Eds.). (1974). Stressful life events: Their nature and effects. New York: Wiley-Interscience.

Dohrenwend, B. S., & Dohrenwend, B. P. (1978). Some issues in research on stressful life events. The Journal of Nervous and Mental Disease, 166, 7-15.

Dohrenwend, B. S., & Dohrenwend, B. P. (Eds.). (1981). Stressful life events and their contexts. New York: Prodist.

Eaton, W. W. (1978). Life events, social supports, and psychiatric symptoms: A re-analysis of the New Haven data. Journal of Health and Social Behavior, 19, 230234.

Eckenrode, J. (1984). The impact of chronic and acute stressors on daily reports of mood. Journal of Personality and Social Psychology, 46, 907-918.

Endler, N. S., & Magnusson, D. (1976). Toward an interactional psychology of personality. Psychological Bulletin, 83, 956-974.

Eron, L., & Peterson, R. A. (1982). Abnormal behavior: Social approaches. Annual review of psychology, 33, 231-264.

Fiore, J., Becker, J., & Coppel, D. B. (1983). Social network interactions: A buffer or a stress? American Journal of Community Psychology, 11, 423-439.

Fitts, W. H. (1964). Tennessee self concept scale. Nashville, TN: Counselor Recordings and Tests.

Fleishman, J. A. (1984). Personality characteristics and coping patterns. Journal of Health and Social Behavior, 25, 229-244.

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. Journal of Health and Social Behavior, 21, 219-239.

French, J. R. P., Jr., Rodgers, W., & Cobb, S. (1974). Adjustment as a person-environment fit. In G. C. Coelho, D. Hamburg, & J. Adams (Eds.), Coping and adaptation. New York: Basic Books.

Fromm, E. (1947). Man for himself. New York: Holt, Rinehart, & Winston.

Funk, S. C., & Houston, B. Kent. (1987). A critical analysis of the hardiness scale's validity and utility. Journal of Personality and Social Psychology, 53, 572-578.

Ganellen, R. J., & Blaney, P. H. (1984). Hardiness and social support as moderators of the effects of life stress. Journal of Personality and Social Psychology, 47, 156-163.

George, L. K. (1980). Role transitions in later life. Belmont, CA: Wadsworth.

Gergen, J. J., & Morse, S. J. (1967). Self-consistency: Measurement and validation. Proceedings of the 75th annual convention of the American Psychological Association, 2, 202-208.

Gibson, J., Brennan, M., Brown, S. D., & Multon, K. D. (1989, August). The structure of college adjustment among nontraditional students. Paper presented at the annual meeting of the American Psychological Association, New Orleans, LA.

Glass, D. C., & Singer, J. E. (1972). Urban stress: Experiments on noise and social stressors. New York: Academic.

Gore, S. (1978). The effect of social support in moderating the health consequences of unemployment. Journal of Health and Social Behavior, 19, 157-165.

Gove, W. R. (1972). Sex, marital status, and suicide. Journal of Health and Social Behavior, 13, 204-213.

Gove, W. R. (1978). Sex differences in mental illness among adult men and women: An evaluation of four questions raised regarding the evidence on the higher rates of women. Social Science and Medical Behavior, 12, 187-198.

Grant, I., Patterson, T., Olshen, R., & Yager, J. (1987). Life events do not predict symptoms: Symptoms predict symptoms. Journal of Behavioral Medicine, 10, 231-240.

Haan, N. (1977). Coping and defending: Processes of self-environment organization. New York: Academic.

Hahn, M. E. (1966). The California Life Goals Evaluation Schedules: Manual. Los Angeles: Western Psychological Services.

Hansson, R. O., Jones, W. H., & Carpenter, B. N. (1984). Relationship competence and social support. In P. Shaver (Ed.), Review of Personality and Social Psychology (Vol. 5, pp. 265-284). Beverly Hills, CA: Sage.

Heller, K., & Swindle, R. W. (1983). Social networks, perceived social support, and coping with stress. In R. D. Felner, L. A. Jason, J. N. Moritsugu, S. S. Farber (Eds.), Preventive psychology: Theory, research and practice (pp. 87-103). New York: Pergamon Press.

Heller, K., Swindle, R. W. Jr., & Dusenbury, L. (1986). Component social support processes: Comments and integration. Journal of Consulting and Clinical Psychology, 54, 466-470.

Henderson, S. (1977). The social network, support and neurosis: The function of attachment in adult life. British Journal of Psychiatry, 131, 185-191.

Henderson, S. (1980). A development in social psychiatry: The systematic study of social bonds. Journal of Nervous and Mental Disease, 168, 63-69.

Henderson, S., Byrne, D. G., & Duncan-Jones, P. (1981). Neurosis and social environment. Sidney, Australia: Academic.

Hinkle, L., Jr. (1974). The effect of exposure to culture change, social change, and changes in interpersonal relationships on health. In B. S. Dohrenwend & B. P. Dohrenwend (Eds.), Stressful life events: Their nature and effects (pp. 9-44). New York: Wiley-Interscience.

Hobfoll, S. E. (1985). Personal and social resources and the ecology of stress resistance. In P. Shaver (Ed.), Review of Personality and Social Psychology. Vol. 6. Self, situations, and social behavior (pp. 265-290). Beverly Hills, CA: Sage.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. American Psychologist, 44, 513-524.

Hobfoll, S. E., & Leiberman, J. R. (1987). Personality and social resources in immediate and continued stress resistance among women. Journal of Personality and Social Psychology, 52, 18-26.

Holahan, C. J., & Moos, R. H. (1986). Personality, coping, and family resources in stress resistance: A longitudinal analysis. Journal of Personality and Social Psychology, 51, 389-395.

Holahan, C. J., & Moos, R. H. (1987). Personal and contextual determinants of coping strategies. Journal of Personality and Social Psychology, 52, 946-955.

Hollingshead, A. B., & Redlich, F. C. (1958). Social Class and Mental Illness. New York: Wiley.

Holmes, T. S. (1970). Adaptive behavior and health change. Medical thesis. University of Washington, Seattle.

Holmes,T., & Masuda, M. (1974). Life change and illness susceptibility. In B. S. Dohrenwend & B. P. Dohrenwend (Eds.), Stressful life events: Their nature and effects (pp. 45-72). New York: Wiley-Interscience.

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. Journal of Psychosomatic Research, 11, 213-218.

Hull, J. G., Van Treuren, R. R., & Virnelli, S. (1987). Hardiness and health: A critique and alternative approach. Journal of Personality and Social Psychology, 53, 518-530.

Hull, J. G., Van Treuren, R. R., & Propsom, P. M. (1988). Attributional style and the components of hardiness. Personality and Social Psychology Bulletin, 14, 505-513.

Jackson, D. N. (1974). Personality research form manual. Goshen, New York: Research Psychologists Press. (rev. ed.)

James, W. (1911). The energies of men. In H. James, Jr. (Ed.), Memories and studies. New York: Longmans, Green, & Company.

Jemmott, J. B., & Locke, S. E. (1984). Psychosocial factors, immunologic mediation, and human susceptibility to disease: How much do we know? Unpublished manuscript, Department of Psychology, Princeton University.

Johnson, J. G., & Sarason, I. G. (1978). Life stress, depression and anxiety: Internal-external control as a moderator variable. Journal of Psychosomatic Research, 22, 205-208.

Jones, W. H. (1985). The psychology of loneliness: Some personality issues in the study of social support. In I. G. Sarason & B. R. Sarason (Eds.), Social support: Theory, research and applications (pp. 225-241). Dordrecht, The Netherlands: Martinus Nijhoff.

Jöreskog, K. G., & Sörbom, D. (1986). LISREL VI: Analysis of linear structural relationships by the method of maximum likelihood (4th ed.). Mooresville, IN: Scientific Software.

Kannel, W. B. (1979). Cardiovascular disease: A multifactorial problem (Insights from the Framingham Study). In M. L. Pollock & D. H. Schmidt (Eds.), Heart disease and rehabilitation (pp.15-31). New York: Wiley.

Kanner, A. D., Coyne, J. C., Schaefer, C., & Lazarus, R. S. (1981). Comparison of two modes of stress management: Daily hassles and uplifts versus major life events. Journal of Behavioral Medicine, 4, 1-39.

Kaufman, H. G. (1982). Professionals in search of work: Coping with the stress of job loss and underemployment. New York: Wiley.

Kessler, R. C. (1979). Stress, social status, and psychological distress. Journal of Health and Social Behavior, 20, 259-272.

Kessler, R. C., & Cleary, P. D. (1980). Social class and psychological distress. American Sociological Review, 45, 63-78.

Kessler, R. C., & McLeod, J. D. (1985). Social support and psychological distress in community surveys. In S. Cohen, & L. Syme (Eds.), Social support and health. New York: Academic.

Kessler, R. C., McLeod, J. D., & Wethington, E. (1984). The costs of caring: A perspective on the relationship between sex and psychological distress. In I. G. Sarason & B. R. Sarason (Eds.), Social support: Theory, research and applications. The Hague: Martinus Nijhoff.

Kessler, R. C., Price, R. H., & Wortman, C. B. (1985). Social factors in psychopathology: Stress, social support, and coping processes. Annual Review of Psychology, 36, 531-572.

Kleinmuntz, B. (1961). The college maladjustment scale (Mt): Norms and predictive validity. Educational and Psychological Measurement, 21, 1029-1033.

Kobasa, S. C. (1979a). Stressful life events, personality, and health: An inquiry into hardiness. Journal of Personality and Social Psychology, 37, 1-11.

Kobasa, S. C. (1979b). Personality and resistance to illness. American Journal of Community Psychology, 7, 413-423.

Kobasa, S. C. (1981). Personality and stress-resistance across professional groups. Paper presented at the 88th annual convention of the American Psychological Association, Montreal, 1980. (ERIC Document Reproduction Service No.: ED 197 268.

Kobasa, S. C. (1982a). Commitment and coping in stress resistance among lawyers. Journal of Personality and Social Psychology, 42, 707-717.

Kobasa, S. C. (1982b). The hardy personality: Toward a social psychology of stress and health. In G. S. Sanders & J. Suls (Eds.), Social Psychology of health and illness (pp. 3-32). Hillsdale, NJ: Lawrence Erlbaum.

Kobasa, S. C. O. (1985). Personality and health: Specifying and strengthening the conceptual links. In P. Shaver (Ed.), Review of personality and social psychology: Vol. 6. Self, situations, and social behavior (pp. 291-311). Beverly Hills: Sage.

Kobasa, S. C., Hilker, R. R. J., & Maddi, S. R. (1979). Who stays healthy under stress? Journal of Occupational Medicine, 21, 595-598.

Kobasa, S. C., & Maddi, S. R. (1977). Existential personality theory. In R. Corsini (Ed.), Current personality theories. Itasca, IL: T. F. Peacock.

Kobasa, S. C., Maddi, S. R., & Courington, S. (1981). Personality and constitution as mediators in the stress-illness relationship. Journal of Health and Social Behavior, 22, 368-378.

Kobasa, S. C., Maddi, S. R., Donner, E. J., Merrick, W. A., & White, H. (1984). The personality construct of hardiness. Unpublished manuscript.

Kobasa, S. C., Maddi, S. R., & Kahn, S. (1982). Hardiness and health: A prospective study. Journal of Personality and Social Psychology, 42, 168-177.

Kobasa, S. C., Maddi, S. R., & Puccetti, M. C. (1982). Personality and exercise as buffers in the stress-illness relationship. Journal of Behavioral Medicine, 5, 391-404.

Kobasa, S. C. O., Maddi, S. R., Puccetti, M. C., & Zola, M. A. (1985). Effectiveness of hardiness, exercise and social support as resources against illness. Journal of Psychosomatic Research, 29, 525-533.

Kobasa, S. C., Maddi, S. R., & Zola, M. A. (1983). Type A and hardiness. Journal of Behavioral Medicine, 6, 41-51.

Kobasa, S. C., & Puccetti, M. C. (1983). Personality and social resources in stress resistance. Journal of Personality and Social Psychology, 45, 839-850.

Kohn, M. L. (1973). Social class and schizophrenia: A critical review and a reformulation. Schizophrenia Bulletin, 7, 60-79.

Kohn, M. L. (1977). Reassessment. In M. L. Kohn (Ed.), Class and conformity: A study in values (pp. 25-60). Chicago: University of Chicago Press. Second edition.

Kohn, M., & Schooler, C. (1978). The reciprocal effects of the substantive complexity of work and intellectual flexibility: A longitudinal assessment. American Journal of Sociology, 84, 24-52.

Krantz, D. S., Grunberg, N. E., & Baum, A. (1985). Health psychology. Annual Review of Psychology, 36, 349-383.

Kuo, W. H., & Tsai, Y. M. (1986). Social networking, hardiness and immigrants' mental health. Journal of Health and Social Behavior, 27, 133-149.

Langner, T. S., & Michael, S. T. (1963). Life stress and mental health: The midtown Manhattan study. New York: Free Press.

Langone, M. (1979). Assertiveness and Lewinsohn's theory of depression: An empirical test. Behavior Therapist, 2, 21.

LaRocco, J., House, J., & French, Jr., J. (1980). Social support, occupational stress and health. Journal of Health and Social Behavior, 21, 202-219.

Lazarus, R. S. (1966). Psychological stress and the coping process. New York: McGraw-Hill.

Lazarus, R. S. (1981). The stress and coping paradigm. In C. Eisdorfer & D. Cohen (Eds.), Models for clinical psychopathology (pp. 177-214). New York: Spectrum.

Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer.

Lazarus, R. S., Kanner, A., & Folkman, S. (1980). Emotions: A cognitive-phenomenological analysis. In R. Plutchik & H. Kellerman (Eds.), Theories of emotion (pp. 189-214). New York: Academic Press.

Lazarus, R. S., & Launier, R. (1978). Stress-related transactions between person and environment. In L. A. Pervin & M. Lewis (Eds.). Perspectives in interactional psychology (pp. 287-327). New York: Plenum Press.

Lefcourt, H. M. (1973). The function of the illusions of control and freedom. American Psychologist, 28, 417-425.

Lefcourt, H. M. (Ed.) (1981a). Research with the locus of control construct: Vol. 1. Assessment methods. New York: Academic Press.

Lefcourt, H. M. (1981b). Locus of control and stressful life events. In B. S. Dohrenwend & B. P. Dohrenwend (Eds.), Stressful life events and their contexts (pp. 157-166). New York: Prodist.

Lefcourt, H. M. (1982). Locus of control: Current trends in theory and research (2nd ed.). Hillsdale, N. J.: Lawrence Erlbaum.

Lefcourt, H. M. (1983). The locus of control as a moderator variable: Stress. In H. M. Lefcourt (Ed.), Research with the locus of control construct: Vol. 2. Developments and social problems (pp. 253-268). New York: Academic Press.

Lefcourt, H. M. (1985). Intimacy, social support, and locus of control as moderators of stress. In I. G. Sarason & B. R. Sarason (Eds.), Social support: Theory, research, and applications (pp. 155-172). Dordrecht, The Netherlands: Martinus Nijhoff.

Lefcourt, H. M., Martin, R. A., & Saleh, W. E. (1984). Locus of control and social support: Interactive moderators of stress. Journal of Personality and Social Psychology, 47, 378-389.

Lent, R. W., Brown, S. D., & Larkin, K. C. (1984). Relation of self-efficacy expectations to academic achievement and persistence. Journal of Counseling Psychology, 31, 356-362.

Lewin, K. (1938). The conceptual representation and measurement of psychological forces. Durham, NC: Duke University Press.

Likert, R. (1932). A technique for the measurement of attitudes. Archives of Psychology, No. 140.

Lin, N., Dean, A., & Ensel, W. (Eds.). (1986). Social support, life events, and depression. New York: Academic Press.

Lindemann, E. (1944). Symptomatology and management of acute grief. American Journal of Psychiatry, 101, 141-148.

Maddi, S. R. (1967). The existential neurosis. Journal of Abnormal Psychology, 72, 311-325.

Maddi, S. R. (1970). The search for meaning. In M. Page (Ed.), Nebraska symposium on motivation (Vol. 18). Lincoln: University of Nebraska Press.

Maddi, S. R. (1980). Alienation attitudes and exploratory behavior. (Report No. CG 014 812). Paper presented at the 88th annual convention of the American Psychological Association, Montreal. (ERIC Document Reproduction Service No. ED 195 861.

Maddi, S. R., & Kobasa, S. C. (1984) The hardy executive: Health under stress. Homewood, IL: Dow Jones-Irwin.

Maddi, S. R., Kobasa, S. C., & Hoover, M. (1979). An alienation test. Journal of Humanistic Psychology, 19, 73-76.

Marsh, H. W. (1986). Self-Concept. Journal of Personality and Social Psychology, 51, 1224-1237.

Mason, J. W. (1971). A re-evaluation of the concept of "non-specificity" in stress theory. Journal of Psychiatric Research, 8, 323-333.

McClelland, D. C. (1964). The achieving society. New York: Free Press.

McCrae, R. R., & Costa, P. T., Jr. (1986). Personality, coping, and coping effectiveness in an adult sample. Journal of Personality, 54, 385-405.

McFarlane, A. H., Norman, G. R., Streiner, D. L., Roy. R., Scott, D. J. (1980). A longitudinal study of the influence of the psychosocial environment on health status: A preliminary report. Journal of Health and Social Behavior, 21, 124-133.

McGrath, J. E. (Ed.). (1970). Social and psychological factors in stress. New York: Holt, Rinehart, & Winston.

Meichenbaum, D. (1977). Cognitive-behavior modification: An integrative approach. New York: Plenum.

Menaghan, E. (1983). Individual coping efforts: Moderators of the relationship between life stress and mental health outcomes. In H. B. Kaplan (Ed.), Psychosocial stress: Trends in theory and research (pp. 157-191). New York: Academic.

Meyer, A. (1948). Cited in A. Lief, ed. The commonsense psychiatry of Dr. Adolf Meyer. New York: McGraw-Hill.

Meyer, A. (1951). The life-chart and the obligation of specifying positive data in psychopathological diagnosis. In E. E. Winters (Ed.), The collected papers of Adolf Meyer: Vol. 3. Medical Teaching (pp. 52-56). Baltimore: Johns Hopkins University Press.

Mitchell, R. E., Cronkite, R. C., & Moos, R. H. (1983). Stress, coping, and depression among married couples. Journal of Abnormal Psychology, 92, 433-448.

Monroe, S. M. (1983). Major and minor life events as predictors of psychological distress: Further issues and findings. Journal of Behavioral Medicine, 6, 189-205.

Moos, R. H., Insel, P. M., & Humphrey, B. (1974). Family, work and group environment scales manual. Palo Alto, CA: Consulting Psychologists Press.

Moos, R. H. (1977). Coping with physical illness. New York: Plenum.

Moos, R. H., & Billings, A. G. (1982). Conceptualizing and measuring coping resources and processes. In L. Goldberger & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects (pp. 212-230). New York: Free Press.

Moss, G. E. (1973). Illness, immunity, and social interaction. New York: Wiley.

Mueller, D. P., Edwards, D. W., & Yarvis, R. M. (1977). Stressful life events and psychiatric symptomatology: Change or undesirability? Journal of Health and Social Behavior, 18, 307-317.

Mullen, B., & Suls, J. (1982). The effectiveness of attention and rejection as coping styles: A meta-analysis of temporal differences. Journal of Psychosomatic Research, 26, 43-49.

Murray, H. (1938). Explorations in personality. New York: Oxford University Press.

Neugarten, B. L. (1974). The middle years. In S. Arieti, (Ed.), American Handbook of Psychiatry. (Vol 1, pp. 592-608). New York: Basic Books.

Norman, W. T. (1965). Double-split cross-validation: An extension of Mosier's design, two undesirable alternatives, and some enigmatic results. Journal of Applied Psychology, 49, 348-357.

Pagel, M., & Becker, J. (1987). Depressive thinking and depression: Relations with personality and social resources. Journal of Personality and Social Psychology, 52, 1043-1052.

Parkes, C. M. (1975). Unexpected and untimely bereavement: A statistical study of young Boston widows and widowers. In B. Schoenberg, I. Gerber, A. Wiener, A. H. Kutscher, D. Peretz, & A. C. Carr (Eds.), Bereavement: Its psychosocial aspects (pp. 119-138). New York: Columbia University Press.

Parkes, K. R. (1986). Coping in stressful episodes: The role of individual differences, environmental factors, and situational characteristics. Journal of Personality and Social Psychology, 51, 1277-1292.

Parkes, C. M., & Weiss, R. S. (1983). Recovery from bereavement. New York: Basic Books.

Pearlin, L. I. (1980a). The life-cycle and life strains. In H. Blalock, Jr. (Ed.), Sociological theory and research. New York: Free Press/Macmillan.

Pearlin, L. I. (1980b). Life-strains and psychological distress among adults: A conceptual overview. In N. J. Smelser & E. H. Erikson (Eds.), Themes of love and work in adulthood. Cambridge, MA: Harvard University Press.

Pearlin, L. I., Lieberman, M. A., Menaghan, E. G., & Mullan, J. T. (1981). The stress process. Journal of Health and Social Behavior, 22, 337-356.

Pearlin, L. I., & Schooler, C. (1978). The structure of coping. Journal of Health and Social Behavior, 19, 2-22.

Procidano, M. E., & Heller, K. (1983). Measures of perceived social support from friends and family: Three validation studies. American Journal of Community Psychology, 11, 1-24.

Rabkin, J. G., & Struening, E. L. (1976). Life events, stress and illness. Science, 194, 1013-1020.

Rahe, R. H., & Lind, E. (1971). Psychosocial factors and sudden cardiac death: A pilot study. Journal of Psychosomatic Research, 15, 19-24.

Reker, G. T., & Wong, P. T. P. (1985). Personal optimism, physical and mental health: The triumph of successful aging. In J. E. Birren & J. Livingston (Eds.), Cognition, stress, and aging (pp. 134-173). Englewood Cliffs, NJ: Prentice-Hall.

Rhodewalt, F., & Agustsdottir, S. (1984). On the relationship of hardiness to the Type A behavior pattern: Perception of life events versus coping with life events. Journal of Research in Personality, 18, 212-223.

Rhodewalt, F., & Zone, J. (1989). Appraisal of life change, depression, and illness in hardy and nonhardy women. Journal of Personality and Social Psychology, 56, 81-88.

Ribble, M. A. (1944). Infantile experience in relation to personality development. In J. McV. Hunt (Ed.), Personality and the behavior disorders (Vol. 2, pp. 621-651). New York: Ronald Press.

Rich, V. L., & Rich, A. R. (1985, August). Personality hardiness and burnout in female staff nurses. Paper presented at the annual convention of the American Psychological Association, Los Angeles.

Rich, A. R., Sullivan, J. A., & Rich, V. L. (1986). Hardiness, social support, and depression in college students. Paper presented at the annual meeting of the Midwestern Psychological Association, Chicago.

Riley, V. (1981). Psychoneuroendocrine influences on immunocompetence and neoplasia. Science, 212, 1100-1109.

Riley, D., & Eckenrode, J. (1986). Social ties: Subgroup differences in costs and benefits. Journal of Personality and Social Psychology, 51, 770-778.

Rodin, J., & Langer, E. J. (1977). Long-term effects of a control-relevant intervention with the institutionalized aged. Journal of Personality and Social Psychology, 35, 897-902.

Rook, K. S. (1984). The negative side of social interaction: Impact on psychological well-being. Journal of Personality and Social Psychology, 46, 1097-1108.

Rosenbaum, M. (1983). Learned resourcefulness as a behavioral repetoire for the self-regulation of internal events: Issues and speculations. In M. Rosenbaum, C. M. Franks, & Y. Jaffe (Eds.), Perspectives on Behavior Therapy in the Eighties (pp. 54-73). New York: Springer.

Rosenstiel, A. K., & Roth, S. (1981). Relationship between cognitive activity and adjustment in four spinal-cord-injured individuals: A longitudinal investigation. Journal of Human Stress, 7, 35-43.

Ross, C. E., & Mirowski, II, J. (1979). A comparison of life event weighting schemes: Change, undesirability and effect-proportional indices. Journal of Health and Social Behavior, 20, 166-177.

Roth, D. L., Wiebe, D. J., Fillingim, R. B., & Shay, K. A. (1989). Life events, fitness, hardiness, and health: A simultaneous analysis of proposed stress-resistance effects. Journal of Personality and Social Psychology, 57, 136-142.

Rotter, J. B., Seeman, M., & Liverant, S. (1962). Internal vs. external locus of control of reinforcement: A major variable in behavior theory. In N. F. Washburne (Ed.), Decisions, values, and groups (pp. 473-516). London: Pergamon Press.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement, Psychological Monographs, 80 (1, Whole No. 609).

Rutter, M. (1981). Stress, coping and development: Some issues and some questions. Journal of Child Psychology and Psychiatry and Allied Disciplines, 22, 323-356.

Sandler, I. N., & Barrera, M. Jr. (1984). Toward a multimethod approach to assessing the effects of social support. American Journal of Community Psychology, 12, 37-52.

Sandler, I. N., & Lakey, B. (1982). Locus of control as a stress moderator: The role of control perceptions and social support. American Journal of Community Psychology, 10, 65-80.

Sarason, I. G., & Sarason, B. R. (1982). Concomitants of social support: Attitudes, personality characteristics, and life experiences. Journal of Personality, 50, 331-344.

Sarason, I. G., Sarason, B. R., & Shearin, E. N. (1986). Social support as an individual difference variable: Its stability, origins, and relational aspects. Journal of Personality and Social Psychology, 50, 845-855.

Sarason, B. R., Shearin, E. N., Pierce, G. R., & Sarason, I. G. (1987). Interrelations of social support measures: Theoretical and practical implications. Journal of Personality and Social Psychology, 52, 813-832.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. Health Psychology, 4, 219-247.

Scheier, M. F., & Carver, C. S. (1987). Dispositional optimism and psychological well-being: The influence of generalized outcome expectancies on health. Journal of Personality, 55, 169-210.

Scheier, M. F., Weintraub, J. K., & Carver, C. S. (1986). Coping with stress: Divergent strategies of optimists and pessimists. Journal of Personality and Social Psychology, 51, 1257-1264.

Schlosser, M. B., & Sheeley, L. A. (1985, August). The hardy personality: Females coping with stress. Paper presented at the annual convention of the American Psychological Association, Los Angeles.

Schmied, L. A., & Lawler, K. A. (1986). Hardiness, Type A behavior, and the stress-illness relation in working women. Journal of Personality and Social Psychology, 51, 1218-1223.

Schwab, J. J., & Schwab, M. E. (1978). Sociocultural roots of mental illness: An epidemiological survey. New York: Plenum.

Seligman, M. E. P. (1975). Helplessness: On depression, development, and death. San Francisco: W. H. Freeman.

Selye, H. (1956). The stress of life. New York: McGraw-Hill.

Shanan, J., De-Nour, A. K., & Garty, I. (1976). Effects of prolonged stress on coping style in terminal renal failure patients. Journal of Human Stress, 2, 19-27.

Shumaker, S. A., & Brownell, A. (1984). Toward a theory of social support: Closing conceptual gaps. Journal of Social Issues, 40, 11-36.

Silver, R. L., & Wortman, C.B. (1980). Coping with undesirable life events. In J. Garber & M. E. P. Seligman (Eds.), Human helplessness: Theory and applications (pp. 279-375). New York: Academic.

Singer, P., & Rich, A. (1985). Personality hardiness in college students: Failure to replicate. Paper presented at the annual meeting of the American Psychological Association, Los Angeles, CA.

Smith, M. B. (1968). Competence and socialization. In J. Clausen (Ed.), Socialization and Society (pp. 271-319). Boston: Little, Brown.

Smith, R. E., Johnson, J. H., & Sarason, I. G. (1978). Life change, the sensation seeking motive, and psychological distress. Journal of Consulting and Clinical Psychology, 46, 348-349.

Smith, T. W., Pope, M. K., Rhodewalt, F., & Poulton, J. L. (1989). Optimism, neuroticism, coping, and symptom reports: An alternative interpretation of the Life Orientation Test. Journal of Personality and Social Psychology, 56, 640-648.

Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). Manual for the State-Trait Anxiety Inventory. Palo Alto, CA: Consulting Psychologists Press.

Spitz, R. A. (1945). Hospitalism: An enquiry into the genesis of psychiatric conditions in early childhood. Psychoanalytic Study of the Child, 1, 53-74. New York: International Universities Press.

Spitz, R. A. (1946). Anaclitic depression. Psychoanalytic Study of the Child, 2, 313-342. New York: International Universities Press.

SPSS-X User's Guide: A complete guide to SPSS-X language and operations. (1988). Third edition (Release 3.0) Chicago: SPSS, Inc. (Computer program: Factor).

Stokols, D. (1975). Toward a psychological theory of alienation. Psychological Review, 82, 26-44.

Stone, A. A., & Neale, J. M. (1984). Effects of severe daily events on mood. Journal of Personality and Social Psychology, 46, 137-144.

Stroebe, M., & Stroebe, W. (1983). Who suffers more?: Sex differences in health risks of the widowed. Psychological Bulletin, 93, 279-301.

Suls, J., & Mullen, B. (1981). Life events, perceived control, and illness: The role of uncertainty. Journal of Human Stress, 7, 30-34.

Taylor, S. E. (1983). Adjustment to threatening events: A theory of cognitive adaptation. American Psychologist, 38, 1161-1173.

Thoits, P. A. (1982). Conceptual, methodological, and theoretical problems in studying social support as a buffer against life stress. Journal of Health and Social Behavior, 23, 145-159.

Thoits, P. A. (1983). Dimensions of life stress that influence psychological distress: An evaluation and synthesis of the literature. In H. R. Kaplan (Ed.), Psychological distress: Trends in theory and research (pp. 33-103). New York: Academic Press.

Thoits, P. A. (1985). Social support and psychological well-being: Theoretical possibilities. In I. G. Sarason & B. R. Sarason (Eds.), Social support: Theory, research and applications (pp. 51-72). Dordrecht, the Netherlands: Martinus Nijhoff.

Thoits, P. A. (1987). Gender and marital status differences in control and distress: Common stress versus unique stress explanations. Journal of Health and Social Behavior, 28, 7-22.

Thompson, W. R., & Schaefer, T., Jr. (1961). Early environmental stimulation. In D. W. Fiske & S. R. Maddi (Eds.), Functions of varied experience. Homewood, IL: Dorsey Press.

Turner, R. J. (1983). Direct, indirect, and moderating effects of social support on psychological distress and associated conditions. In H. B. Kaplan (Ed.), Psychosocial Stress: Trends in theory and research (pp. 105-155). New York: Academic.

Vachon, M. L. S., Rogers, J., Lyall, W., Lancee, W., Sheldon, A., & Freeman, S. (1982). Predictors and correlates of adaptation to conjugal bereavement. American Journal of Psychiatry, 139, 998-1002.

Vaillant, G. E. (1976). Natural history of male psychological health: Vol. 5. The relation of choice of ego mechanisms of defense to adult adjustment. Archives of General Psychiatry, 33, 535-545.

Vaillant, G. E. (1977). Adaptation to life. Boston: Little, Brown.

Videka-Sherman, L. (1982). Coping with the death of a child: A study over time. American Journal of Orthopsychiatry, 52, 688-698.

Vinokur, A. & Selzer, M. L. (1975). Desirable versus undesirable life events: Their relationship to stress and mental distress. Journal of Personality and Social Psychology, 32, 329-337.

Wallerstein, J. S., & Kelly, J. B. (1980). Surviving the break-up: How children and parents cope with divorce. New York: Basic Books.

Wallston, B. S., Alagna, S. W., DeVellis, B. M., & DeVellis, R. F. (1983). Social support and physical health. Health Psychology, 2, 367-391.

Watkins, D. (1978). The development and evaluation of self-esteem measuring instruments. Journal of Personality Assessment, 42, 171-182.

Watson, D., & Pennebaker, J. W. (1989). Health complaints, stress, and distress: Exploring the central role of negative affectivity. Psychological Review, 96, 234-254.

Weinberger, M., Hiner, S. L., & Tierney, W. M. (1987). In support of hassles as a measure of stress in predicting health outcomes. Journal of Behavioral Medicine, 10, 19-31.

Wethington, E. & Kessler, R. C. (1986). Perceived support, received support, and adjustment to stressful life events. Journal of Health and Social Behavior, 27, 78-89.

Wheaton, B. (1978). The sociogenesis of psychological disorder: Reexamining the causal issues with longitudinal data. American Sociological Review, 43, 383-403.

Wheaton, B. (1982). A comparison of the moderating effects of personal coping resources on the impact of exposure to stress in two groups. Journal of Community Psychology, 10, 293-311.

Wheaton, B. (1983). Stress, personal coping resources, and psychiatric symptoms: An investigation of interactive models. Journal of Health and Social Behavior, 24, 208-229.

Wheaton, B. (1985). Models for the stress-buffering functions of coping resources. Journal of Health and Social Behavior, 26, 352-364.

White, R. W. (1959). Motivation reconsidered: The concept of competence. Psychological Review, 66, 297-333.

Wiebe, D. J., & McCallum, D. M. (1986). Health practices and hardiness as mediators in the stress-illness relationship. Health Psychology, 5, 425-438.

Wilcox, B. L. (1981). Social support in adjusting to marital disruption: A network analysis. In B. H. Gottlieb (Ed.), Social networks and social support (pp. 97-115). Beverly Hills, CA: Sage.

Williams, A. W., Ware, J. E., & Donald, C. A. (1981). A model of mental health, life events, and social supports applicable to general populations. Journal of Health and Social Behavior, 22, 324-336.

Worden, J. W., & Sobel, H. J. (1978). Ego strength and psychosocial adaptation to cancer. Psychosomatic medicine, 40, 585-592.

Wyatt, R. C., & Meyers, L. S. (1987). Psychometric properties of four 5-point Likert-type response scales. Educational and Psychological Measurement, 47, 27-35.

Wyler, A. R., Masuda, M., & Holmes, T. H. (1968). Seriousness of illness rating scale. Journal of Psychosomatic Research, 11, 363-375.

Zika, S., & Chamberlain, K. (1987). Relation of hassles and personality to subjective well-being. Journal of Personality and Social Psychology, 53, 155-162.

APPENDIX A

APPENDIX A

A SELF-ASSESSMENT INVENTORY

Directions: This questionnaire contains 70 statements that may or may not be characteristic of you. Please read each statement carefully, and then, using the scale below, rate how characteristic each statement is of you. Please be frank and rate each statement in terms of how characteristic it is of you, not of how you would like to be. Next to each statement, circle the number that corresponds to your rating.

1 Not characteristic of me
2 Somewhat characteristic of me
3 Quite characteristic of me
4 Very characteristic of me

Remember: Ask yourself, how characteristic is this statement of me?

	Not	Some	Quite	Very
1. I prefer a settled and stable life.	1	2	3	4
2. If my conscience and the law do not agree, I follow the law.	1	2	3	4
3. I have a great deal of control over what happens in my life.	1	2	3	4
4. I believe the individual can make a significant difference in society.	1	2	3	4
5. I feel the greatest reward from my job is the paycheck.	1	2	3	4
6. I prefer to do things my own way.	1	2	3	4
7. I don't reveal much about my life to my family.	1	2	3	4
8. I often feel more alive in risky situations than in routine ones.	1	2	3	4
9. I like to keep things simple.	1	2	3	4
10. I frequently put off making decisions.	1	2	3	4
11. There is very little I can do to change my ways of thinking and behaving.	1	2	3	4
12. I prefer to stay free of close involvement with others.	1	2	3	4
13. I get along well with most of my co-workers.	1	2	3	4
14. I have a basic trust in the usefulness of most social and political institutions in this country.	1	2	3	4

	How characteristic of you? Not	Some	Quite	Very
15. I have a good sense of what I want and where I am going.	1	2	3	4
16. I have little influence on others.	1	2	3	4
17. I see change in my life as a challenge rather than a threat.	1	2	3	4
18. I like being in new situations.	1	2	3	4
19. I feel a strong sense of commitment to my family.	1	2	3	4
20. I find that friends often don't want to get involved when trouble and misfortune come.	1	2	3	4
21. When things go wrong in my life, I chalk it up to bad luck or fate.	1	2	3	4
22. Meeting new people is scary to me.	1	2	3	4
23. I prefer to make decisions on my own.	1	2	3	4
24. I see the world as offering continual opportunities for learning and growth.	1	2	3	4
25. It is usually someone else who gets my life fouled up.	1	2	3	4
26. I am involved with a career to which I feel committed.	1	2	3	4
27. In times of stress, I often act too hastily.	1	2	3	4
28. I am comfortable making decisions in situations where things are unclear.	1	2	3	4
29. I have a clear set of values.	1	2	3	4
30. I make it a point to explore alternative ways of handling difficult situations.	1	2	3	4
31. I don't see much worth in religious institutions.	1	2	3	4
32. I do best in unstructured work situations.	1	2	3	4
33. It is mainly a matter of chance or favor when I succeed.	1	2	3	4
34. I feel that great achievements result from hard work.	1	2	3	4

(appendix continues)

	How characteristic of you? Not	Some	Quite	Very
35. I find that change for its own sake is often helpful.	1	2	3	4
36. I cannot really influence the way others see me.	1	2	3	4
37. I don't like unfamiliar situations.	1	2	3	4
38. I find that people are basically out for themselves.	1	2	3	4
39. There are people in my personal life to whom I feel a strong sense of commitment.	1	2	3	4
40. The future will be what I make it.	1	2	3	4
41. I like to be challenged by new ideas.	1	2	3	4
42. I can usually think of several ways to handle problem situations.	1	2	3	4
43. I live by my own judgment of what is right and wrong.	1	2	3	4
44. I feel comfortably secure and accepting of myself.	1	2	3	4
45. I often learn too late about people and services that could have helped me.	1	2	3	4
46. My job is not really very meaningful to me.	1	2	3	4
47. I believe there is usually one right way to handle most situations.	1	2	3	4
48. I believe that society cares about the needs of individuals.	1	2	3	4
49. I feel that marriages fail primarily because people don't work hard enough on them.	1	2	3	4
50. I enjoy taking on new roles.	1	2	3	4
51. I am very concerned about what others think is best for me to do.	1	2	3	4
52. If I get a promotion, I chalk it up to my own abilities.	1	2	3	4
53. My family roots are very important to me.	1	2	3	4
54. I don't see much meaning in my life.	1	2	3	4

	How characteristic of you? Not	Some	Quite	Very
55. I feel that anybody could do my job at work.	1	2	3	4
56. I prefer not to have other people counting on me.	1	2	3	4
57. Everyday life is exciting to me.	1	2	3	4
58. I can give up immediate rewards for long-term goals.	1	2	3	4
59. Stability is more important to me than change.	1	2	3	4
60. When I need help or support, I know where and to whom to go.	1	2	3	4
61. When something goes wrong, I first look at what I could have done to cause it.	1	2	3	4
62. I prefer to avoid stress and anxiety.	1	2	3	4
63. I would rather not keep moving up to new levels of responsibility at work.	1	2	3	4
64. I find that good friendships are very rare.	1	2	3	4
65. My work gives me a chance to offer something to society.	1	2	3	4
66. I avoid situations where I cannot predict what will happen.	1	2	3	4
67. If I don't know the right people, I cannot get ahead.	1	2	3	4
68. I don't believe strongly in anything.	1	2	3	4
69. I get a lot of emotional support from my family.	1	2	3	4
70. I prefer a lot of variety in my daily life.	1	2	3	4

APPENDIX B

APPENDIX B

Breakdown of Questionnaire Items According to Definitional Subdomains of Hardiness Construct

COMMITMENT TO:								
1. self	15	29	44	54	68			
2. work	5	13	26	46	55	65		
3. family	19	7	53	69				
4. interpersonal	12	20	39	56	64			
5. society	14	31	38	48				
CONTROL:								
1. self as primary determiner	3	4	11	16	34	36	40	67
2. take responsibility	21	25	33	49	52	61		
3. decisional/personal autonomy	2	6	10	23	43	51		
4. flexible coping	27	30	42	47	58			
CHALLENGE:								
1. change as growth; not threat	1	17	24	35	59	62		
2. tolerate ambiguity	9	28	32	66				
3. seek new	18	22	37	41	50	63	70	
4. know resources	45	60						
5. adventurousness (responsible risks)	8	57						

Note. Negatively-worded items are underlined. There are a total of 36 positively-worded items; 34 negatively-worded.

APPENDIX C

APPENDIX C

BACKGROUND INFORMATION

1. Age:_____

2. Gender: (Check one.)
_____Male _____Female

3. Marital Status: (Check one.)
_____Single (never married)
_____Married
_____Separated
_____Widowed
_____Divorced

4. Number of Children in Household:
_____None
_____One
_____Two
_____ Three
_____ More than three

5. Racial/Ethnic Background (Check one.)
_____Asian/Pacific Islands
_____Hispanic
_____Black
_____Native American/American Indian
_____Caucasian
_____Other (specify)_____

6. Number of Hours of Paid Employment Per Week
_____1 to 9
_____10 to 19
_____20 to 29
_____30 to 39
_____40 or more
_____Unemployed
_____Homemaker

7. Yearly Household Income from all Sources:
_____Less than $10,000
_____$10,000 - 19,999
_____$20,000 - 29,999
_____$30,000 - 39,999
_____$40,000 - 49,999
_____$50,000-$59,999
_____$60,000-$69,999
_____$70,000-$79,999
_____$80,00 or more

8. Please rate how important (meaningful) religious belief or spiritual values are to you? Circle one number.

Not Important						Very Important
1	2	3	4	5	6	7

9. Please rate how stressful each of the following areas is to you now. Circle one number for each area.

	Not at all					Very Stressful
9. Work:	1	2	3	4	5	6	7
10. Financial Concerns:	1	2	3	4	5	6	7
11. Family Relationships:	1	2	3	4	5	6	7
12. Interpersonal Relationships:	1	2	3	4	5	6	7
13. Social/Community Involvements:	1	2	3	4	5	6	7
14. Personal/Inner Life Concerns:	1	2	3	4	5	6	7
15. Physical Health/Illness:	1	2	3	4	5	6	7

APPENDIX D

APPENDIX D

Cover Letter

Date

Dear Former or Current Loyola Student:

As you may know, much research has been done exploring the relationship between stress and health. Finding factors that affect this relationship has become very important and may enable us to help people become more stress-resistant. The enclosed questionnaire is an attempt to measure some personality and social factors that are thought to play a role in increasing or decreasing the impact of stress. Specifically, we are seeking in this study to find out how well this questionnaire measures these factors. The questionnaire is being sent to all adults age 25 and over who were enrolled in the University College at some time during the past year. The University College has been kind enough to make its mailing list available for this study.

The questionnaire is being sent to adults who were enrolled in college during the past year, rather than to 18-22 year old undergraduates, because you have had more life experience and are undoubtedly now involved in many areas of life that make demands on your time, energy, and personal resources. Even though this study is being conducted through the mail and therefore may seem somewhat distant and impersonal, please do not feel that your response is unimportant. A large number of respondents is required to make this study effective, and your individual contribution is very important.

This research has been approved by the Counseling and Educational Psychology Department, the Graduate School, and the Institutional Review Board. Your participation is, of course, completely voluntary.

If you do decide to participate, be assured that your responses will be anonymous. All questionnaires have been coded. You do not put your name on them. Please complete and return the questionnaire in the enclosed reply envelope within two weeks of receipt.

If you would like a summary of the study's findings, just print your name and address on the back of the return envelope. Do not place your name or address on the questionnaire itself.

Finally, I know that there are many demands on your time, so I am especially grateful for your participation in this research project.

Sincerely,

Steven D. Brown, Ph.D.
Research Director

Thomas F. Horan
Doctoral Candidate

APPENDIX E

Appendix E

Component Loadings of 67-item, 10-Component Orthogonal Solution

	Components									
	I	II	III	IV	V	VI	VII	VIII	IX	X
Item										
18	.76	.10	.05	.03	.02	.02	-.08	.04	.11	.25
70	.72	.00	.02	-.04	.04	-.04	.03	.07	.11	.05
50	.67	.06	.09	.18	.10	-.02	.07	.00	.32	.13
41	.65	.15	.07	.29	.16	-.07	.05	-.10	.21	.07
59	.64	.05	-.20	.08	.20	-.08	.08	.13	-.17	-.03
17	.59	.11	.01	.33	.16	.15	-.03	-.07	.11	.13
32	.54	-.09	.09	-.01	-.13	-.10	-.15	.23	.07	.07
1	.51	.04	-.15	-.04	.20	-.21	.04	.04	-.36	.05
37	.51	.06	.03	.23	.11	.07	.12	.10	-.16	.42
24	.48	.21	.15	.03	.26	.18	.19	-.21	-.05	-.12
30	.46	.07	.13	.39	-.10	-.04	.13	-.08	.25	-.13
62	.42	-.02	.03	-.08	.37	.07	-.02	-.04	-.31	-.08
28 *	.38	.19	-.08	.22	-.09	.23	-.22	.05	-.01	.24
66 *	.35	-.15	.09	.21	.10	.14	.33	.17	-.07	.27
26	.10	.80	.07	.02	.01	.10	-.02	.08	.11	.00
65	.11	.68	.17	.04	-.09	.04	-.00	-.05	.08	-.11
46	.00	.68	.06	.06	.13	.09	.10	.29	.05	.14
15	.14	.57	.05	.28	.21	.15	-.20	-.16	.19	.13
55	-.08	.53	.06	.00	.24	-.24	-.00	.16	-.11	.32
5	.14	.43	-.05	.08	.01	.11	.42	.17	.00	-.08
57 *	.31	.36	.28	.05	.15	.26	-.04	-.02	.02	.22
69	.00	.03	.75	.01	.17	.09	-.02	.15	.10	.02
19	.02	.01	.73	.08	-.04	.15	.01	.04	.01	.02
53	-.12	-.01	.64	.05	.05	.32	-.11	-.09	-.06	.01
7	.09	.10	.61	-.01	.01	-.13	.25	.07	-.09	.11
39	.10	.12	.59	-.12	.09	-.01	-.01	.04	.02	-.10
60	.00	.13	.43	.02	.04	.09	.06	.20	.25	.12
44 *	.18	.26	.38	.33	.06	.07	-.18	-.22	.26	.16
51	.18	.01	-.21	.66	.07	-.05	-.13	.07	-.04	.05
27	.04	-.05	-.01	.56	.07	-.05	.18	.19	-.00	.21
42	.44	.19	.04	.45	.02	-.01	.12	-.10	.19	.04
10	.01	.16	.11	.43	.16	.15	-.03	-.06	.03	.38
58	.21	.21	.22	.42	-.07	.13	.03	-.29	-.01	-.09
45 *	.04	.16	.21	.36	.22	.08	.01	.34	-.22	.15
29 *	.06	.20	.31	.34	.03	.29	.05	-.14	.29	-.16

(table continues)

		Components								
Item	I	II	III	IV	V	VI	VII	VIII	IX	X
3	.17	.11	.08	.01	.54	.10	-.17	.02	.16	.24
33	-.05	.01	.09	.32	.50	.09	.04	.21	.17	.04
25	.02	-.00	.01	-.20	.49	-.07	.01	.35	-.05	.07
16	.13	.06	.13	.04	.48	-.07	.22	.10	-.05	.09
11	.15	.04	.01	.26	.46	-.04	.32	-.07	.02	.09
40	.33	.10	.16	-.05	.42	.08	-.31	.04	.38	-.05
36	-.01	.08	.15	.21	.41	-.07	.27	.17	-.06	.01
21 *	.17	-.06	-.12	.32	.38	-.10	-.08	.26	-.04	-.12
56 *	.07	.18	.07	.06	.35	.17	.29	.09	-.04	.30
14	.02	.06	.15	.03	-.11	.59	-.08	.11	.14	-.07
31	-.08	-.01	.10	.04	-.08	.51	.21	.05	-.01	.01
4	.19	.30	.04	-.02	.30	.49	.07	-.23	.05	-.00
48	-.04	.23	.21	-.09	.09	.46	-.04	.16	.04	-.12
68	.05	.11	.06	.19	.15	.42	.29	-.07	-.09	.18
2 *	.11	.21	.07	.17	.12	-.33	.10	.03	-.26	-.19
43 *	.27	.20	.11	-.03	-.13	-.30	-.17	-.20	.19	.08
47 *	.10	.01	-.10	.14	.10	.01	.51	.15	-.11	.01
12 *	.11	.04	.22	-.07	.08	.04	.50	.04	.08	.22
6 *	.12	.06	.03	.01	-.03	-.18	-.47	.16	.10	-.03
23 *	.19	.04	-.15	.29	.06	.13	-.47	-.26	-.03	.00
63 *	.10	.08	.01	-.01	.24	.11	.28	.03	.24	.25
20 *	-.00	-.01	.19	-.01	.20	.02	.13	.59	-.00	.05
38 *	.05	.24	.03	.02	.13	.29	.12	.57	.02	.09
67 *	.11	.11	.02	.32	.07	.09	.07	.45	.06	-.19
64 *	.16	.11	.08	-.01	.07	-.03	-.03	.44	-.10	.24
52 *	.15	.08	.02	.02	.06	-.15	-.12	-.12	.62	-.00
34 *	.14	.13	.03	.08	.06	.21	-.10	.02	.58	-.13
35 *	.46	.02	.02	-.04	-.12	.05	.15	.08	.47	-.12
13 *	-.03	.06	.25	-.02	.18	.26	.06	.07	.29	.14
22 *	.30	.05	.11	.16	.08	-.07	.07	.12	-.01	.62
9 *	.13	-.03	-.07	-.03	.09	-.14	.21	.04	-.08	.40
54 *	.04	.35	.06	.15	.34	.13	.09	.12	.11	.37

Note. An asterisk indicates that the item was eliminated from future extraction matrices.

APPENDIX F

Appendix F

Component Loadings of 41-Item, 6-Component Orthogonal Solution

		Components					
Item		I	II	III	IV	V	VI
50	I enjoy new roles	.77	.10	.08	.08	.02	-.03
18	I like new situations	.76	.05	.10	-.04	.17	-.05
41	I like new ideas	.76	.03	.16	.16	-.00	-.06
17	See life as challenge	.68	-.01	.16	.20	.00	.11
70	I prefer variety	.68	.04	-.01	-.11	.23	-.04
42	Several ways to handle	.62	-.02	.13	.22	-.24	.11
30	Explore alternatives	.61	.07	.01	.08	-.27	.08
59	Stability over change	.56	-.22	.02	.05	.42	.02
37	Don't like unfamiliar	.50	.00	.05	.36	.27	.11
32	Do best in unstructured	.48	.08	-.11	-.13	.19	-.16
24	See world as opportunity	.46	.14	.19	.02	.23	.27
40	Future what I make it	.40	.31	.22	.03	-.02	-.30
58	Give up immediate rewards	.38	.10	.15	.09	-.33	.26
69	Get support from family	.05	.79	.08	.11	.02	-.07
19	Committed to family	.08	.71	.02	-.01	-.06	.15
53	Family roots important	-.06	.68	.03	.01	-.15	.19
39	Are people am committed to	.08	.58	.10	-.11	.10	-.00
7	Don't reveal to family	.08	.52	.07	.07	.16	-.02
60	Know where to get help	.10	.48	.18	.11	-.16	-.13
48	Society cares about indiv.	-.08	.33	.27	.01	-.01	.31
26	Have career committed to	.13	.05	.82	-.06	-.00	.06
46	My job is not meaningful	.02	.09	.72	.19	.12	-.01
65	Work chance offer society	.15	.09	.65	-.15	-.09	.12
15	Know what I want/goal	.31	.05	.62	.17	-.24	.01
55	Anybody could do my job	-.04	.02	.55	.25	.18	-.31
5	Paycheck greatest reward	.08	-.03	.38	.14	.25	.33
27	I often act too hastily	.18	-.07	-.09	.58	-.09	.13
33	Chance/favor if I succeed	.04	.17	.13	.57	.10	-.04
11	Can't change my ways	.22	.04	.07	.56	.17	.03
36	Can't influence others	.01	.15	.09	.52	.29	.08
10	I tend put off decisions	.18	.10	.21	.50	-.23	-.02
51	Care what others think	.33	-.28	-.01	.45	-.23	-.00
1	Prefer settled life	.36	-.23	-.02	.04	.58	-.01
62	Prefer avoid stress	.28	.04	-.02	.05	.51	.11
25	Someone else fouls up	-.07	.16	.10	.25	.39	-.36
16	Have little influence	.11	.17	.13	.34	.38	-.07
31	Don't see worth religion	-.13	.20	.02	.10	.03	.55
68	Don't believe strongly	.07	.12	.14	.33	.06	.48
4	Individual make difference	.21	.14	.39	.03	.03	.40
14	Trust in institutions	.04	.29	.16	-.07	-.21	.34
3	Have control of my life	.26	.20	.26	.28	.08	-.30

APPENDIX G

Appendix G

Component Loadings of 41-Item, 4-Component Orthogonal Solution

Item			Components I	II	III	IV
18		I like new situations	.77	.07	.04	.09
50		I enjoy new roles	.76	.14	.07	.06
41		I like new ideas	.75	.23	-.00	.12
70		I prefer variety	.70	-.06	.03	.07
17		See life as challenge	.67	.28	-.03	.11
59		Stability more important	.59	-.05	-.24	.27
30		Explore alternatives	.59	.22	.07	-.16
42		Several ways to handle	.58	.35	-.04	-.05
37		Don't like unfamiliar	.51	.13	-.04	.38
32		Do best in unstructured	.51	-.21	.07	.05
24		World offers opportunity	.46	.21	.15	.14
1		Prefer settled life	.41	-.18	-.26	.37
40	*	Future what I make it	.38	.13	.28	.14
26		Committed to career	.06	.69	.08	.11
15		I know what I want/goals	.24	.67	.05	.07
46		My job not meaningful	-.03	.59	.08	.37
65		Work as offer to society	.09	.59	.13	-.05
4		Individual makes difference	.18	.47	.17	.03
58	*	Give up immediate rewards	.34	.40	.11	-.20
10	*	I tend put off decisions	.14	.40	.05	.22
5	*	Paycheck most important	.07	.38	-.02	.25
68	*	Don't believe anything	.06	.34	.12	.17
69		Get support from family	.06	.05	.77	.20
19		Committed to family	.08	.07	.72	-.01
53		Family roots important	-.06	.12	.69	-.06
39		Are others I'm committed to	.09	.01	.58	.07
7		Don't reveal much to family	.10	.00	.50	.23
60		Know where to get help	.07	.19	.46	.08
48	*	Society cares for individual	-.10	.31	.36	.02
14	*	Basic trust in institutions	.01	.30	.33	-.21
51	*	Concerned what others think	.30	.23	-.33	.09
31	*	See little worth religion	-.12	.20	.23	-.01

(table continues)

Item			Components I	II	III	IV
25		Someone else fouls up my life	-.03	-.13	.10	.55
36		Can't influence others	.02	.13	.08	.55
16		Little influence on others	.14	.04	.12	.54
33		Chance/favor when I succeed	.04	.21	.10	.49
11		Can't change my ways	.22	.17	-.03	.48
55		Anybody could do my job	-.07	.34	-.02	.47
3	**	Have control over my life	.25	.18	.15	.38
62	*	Prefer avoid stress/anxiety	.33	-.13	.02	.34
27	*	I often act too hastily	.18	.17	-.13	.25

Note. Items marked with a single asterisk were eliminated. The item with a double asterisk was retained despite loading <.40 in order to increase internal consistency.

APPROVAL SHEET

The dissertation submitted by Thomas F. Horan
has been read and approved by the following committee:

Dr. Steven D. rown, Director
Professor, Counseling Psychology, and
Chairman, Department of Counseling Psychology, Loyola

Dr. Gloria J. Lewis
Professor, Counseling Psychology and
Chairperson, Counseling and Educational Psychology, Loyola

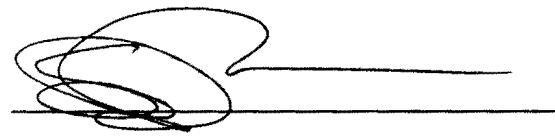
Dr. Kevin J. Hartigan
Former Assistant Professor, Counseling Psychology, Loyola
Currently in Private Practice, Chicago

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy.

6/5/90

Date



Director's Signature